Health Information and Quality Authority

An tÚdarás Um Fhaisnéis agus Cáilíocht Sláinte

Health technology assessment of providing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting

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About the Health Information and Quality Authority

The Health Information and Quality Authority (HIQA) is an independent statutory body established to promote safety and quality in the provision of health and social care services for the benefit of the health and welfare of the public.

Reporting to the Minister for Health and engaging with relevant government Ministers and departments, HIQA has responsibility for the following:

- **Setting standards for health and social care services** — Developing person-centred standards and guidance, based on evidence and international best practice, for health and social care services in Ireland.
- **Regulating social care services** — The Chief Inspector of Social Services within HIQA is responsible for registering and inspecting residential services for older people and people with a disability, and children's special care units.
- **Regulating health services** — Regulating medical exposure to ionising radiation.
- **Monitoring services** — Monitoring the safety and quality of permanent international protection accommodation service centres, health services and children's social services against the national standards. Where necessary, HIQA investigates serious concerns about the health and welfare of people who use health services and children's social services.

  Health technology assessment — Evaluating the clinical and cost effectiveness of health programmes, policies, medicines, medical equipment, diagnostic and surgical techniques, health promotion and protection activities, and providing advice to enable the best use of resources and the best outcomes for people who use our health service.
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- **National Care Experience Programme** — Carrying out national service-user experience surveys across a range of health and social care services, with the Department of Health and the HSE.

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Foreword

Currently in Ireland, people have a range of options to access publicly-funded healthcare, including: attending a general practitioner (GP) during office hours; by ringing GP out-of-hours services; ringing 112/999 emergency ambulance services; self-presenting at an injury unit; or self-presenting at an emergency department (ED). People also have the option to visit a community pharmacy where they can obtain advice, receive treatment for a minor illness or be redirected to other primary care or urgent care services.

An acute, non-urgent medical care need is where the investigation or intervention for an injury or illness could be safely deferred or managed in various healthcare settings. However, it may be challenging for people to know the difference between an urgent and a non-urgent medical need and or to know which healthcare setting is the most appropriate for them to attend.

When primary care services and injury units cannot be readily accessed, people with acute, non-urgent care needs who are unwilling or unable to wait either go to an ED or call 112 or 999 for an emergency ambulance in order to access healthcare. This has contributed to an increased burden on emergency services and EDs. Under the current pathway, there may also be people who require care, but who defer attending the ED as they do not think this level of care is necessary or because they expect long waiting times. Provision of an acute, non-urgent telephone service is intended to support the timely provision of care in the most appropriate setting.

The purpose of this health technology assessment (HTA) was to assess the requirements for the provision of a national telephone service — distinct from the 112/999 emergency services — for acute, non-urgent care needs in the pre-hospital setting. The assessment examined the safety, clinical effectiveness, efficiency and economic impact of such a service in Ireland, as well as the associated organisational, social, legal and ethical considerations.

Work on the HTA was undertaken by an Evaluation Team from the HTA Directorate in HIQA. A multidisciplinary Expert Advisory Group was convened to advise the Evaluation Team during the course of the HTA. HIQA would like to thank the Evaluation Team, the members of the Expert Advisory Group and all who contributed to the preparation of this report.

Dr Máirín Ryan

Deputy Chief Executive & Director of Health Technology Assessment

Health Information and Quality Authority

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The membership of the EAG was as follows:

Dr Mike Bennett	Deputy Clinical Director (National Emergency Operations Centre), National Ambulance Service (NAS)
Dr Annette Burns	Research Officer, Health Research Board
Mr Ray Carney	Clinical Practice Manager, Pre-Hospital Emergency Care Council (PHECC)
Mr Ben Cloney	Assistant National Director, Communications and Digital Services, HSE
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Organisations that assisted HIQA in providing information, in writing or through meetings, included:

- National Ambulance Service
- Dublin Fire Brigade
- Acute Business Information Unit, HSE
- National Primary Care Contracts, HSE
- Programme and Campaigns office, HSE

- NHS 24 Scotland
- Paul Larkin, Facilities Manager, HIQA

Members of the Evaluation Team:

Members of HIQA's Evaluation Team were Dr Carol McLoughlin, Dr Emma Reece, Joan Quigley, Orla Jenkins, Shibu Shrestha, Roberta Gugles, Augusta Zuokemefa, Marie Carrigan, Dr Derek Corrigan, Dr Susan Ahern, Dr Patricia Harrington, Dr Conor Teljeur, and Dr Máirín Ryan.

Conflicts of Interest

None reported.

Advice to the Minister for Health and the Health Service Executive

Following a request from the Health Service Executive (HSE), the Health Information and Quality Authority (HIQA) agreed to undertake a health technology assessment (HTA) of providing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland. This HTA aimed to assess the safety, clinical effectiveness and efficiency of providing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting, as well as the budget impact, organisational, social, legal and ethical issues associated with such a decision.

The key findings of this HTA, which informed HIQA's advice to the Minister for Health and the HSE, were:

- An acute, non-urgent medical care need is where the investigation or intervention for an injury or illness could be safely deferred or managed in various healthcare settings. However, it may be challenging for people to know the difference between an urgent and a non-urgent medical need and or to know which healthcare setting is the most appropriate for them to attend.
- Currently in Ireland, people have a range of options to access publicly-funded healthcare, including:
  - attending a general practitioner (GP) during office hours
  - ringing GP out-of-hours services
  - ringing 112/999 emergency ambulance services
  - self-presenting at an injury unit
  - or self-presenting at an emergency department (ED)
  - People also have the option to visit a community pharmacy where they can obtain advice, receive treatment for a minor illness or be redirected to other primary care or urgent care services.
- The proposed acute, non-urgent telephone service in Ireland would operate as a triage system in the pre-hospital setting. It would involve trained operators taking calls from people who believe they have an acute, non-urgent medical care need. The call operators would provide telephone triage and redirect callers to the most appropriate healthcare setting based on their described symptoms. Provision of an acute, non-urgent telephone service is intended to support the timely provision of care in the most appropriate

setting, which may include advice for self-care and does not necessarily involve referral to a healthcare provider.

- Demand for healthcare services in Ireland has increased due to population growth and an ageing demographic. In addition, broader health reforms such as Sláintecare, are contributing to shifts in how and where care is accessed. While Sláintecare aims to reduce pressure on hospital services by strengthening primary care, this transition may lead to increased demand in primary care. Key indicators of increasing demand include:
  - A high demand for GP visits; in 2023, 76% of the population reported attending a GP.
  - A rise in pharmacy consultations; in 2024, 22% of the public reported using private consultation areas within the last month compared with 15% in 2023.
  - A sustained increase in use of GP out-of-hours (OOH) services, with 1.1 million contacts in 2023, representing a 19% rise in activity since 2014.
  - A 67% increase in the number of connected calls for emergency ambulance services reported by the Emergency Call Answering Service from 2017 to 2023.
  - A significant increase in demand for National Ambulance Service emergency ambulances; the number of medical incidents requiring ambulance dispatch rose by 29% between 2017 and 2022, with 293,000 incidents in 2022.
  - Increased demand for Dublin Fire Brigade ambulance services, rising by 12.1% from 2014 to 2023, with 80,916 incidents in 2023.
  - A 21.4% increase in ED attendances in publicly-funded hospitals from 2016 to 2023, reaching 1.48 million annual attendances. Triage data from 2022 to 2024 show that 23% of ED attendances were classified as 'Standard' or 'Non-Urgent.' These lower-acuity cases, which often do not require hospital admission, highlight the potential for managing many of these patients in other more appropriate healthcare settings.
- A scoping review of international practice was undertaken to assess the evidence for the impact on health outcomes and healthcare delivery for any identified telephone services for acute, non-urgent medical care needs in the pre-hospital setting. Seventy-one studies were included covering 11 countries (Belgium, Denmark, Finland, Sweden, England, Scotland, Switzerland, Australia, Canada [Alberta], Japan and New Zealand). These countries differed with respect to the healthcare system in which the telephone service

was implemented, the maturity of the service, and the extent of analysis conducted. However, the main objective for implementing a telephone service was broadly similar across countries; that is, to reduce ED attendance, and to improve access to timely assistance and appropriate care. The main findings of the review were:

- Studies from five countries reported the impact on ED attendances. Two countries reported a positive effect (avoidance of unnecessary resource use, decreased demand), while three countries reported either no effect or conflicting findings. As such, the international evidence did not clearly demonstrate whether a telephone service leads to reductions in ED attendances. Moreover, there was conflicting evidence of the impact of a telephone service on ambulance and primary care utilisation.
- Across studies, differences were observed in terms of the proportion of callers advised to visit their GP (9% to 69%), attend the ED (5% to 49%), or who were offered self-care advice (7% to 51%). Reasons for service use included the convenience and accessibility of telephone triage and the ability to obtain advice without an appointment. Those with readily accessible GP or ED services in the area were less likely to use the service. Barriers to its use included difficulty in communicating an illness over the phone, and a lack of knowledge and awareness of how to access the service.
- In terms of safety, the proportion of calls that were considered to have been under-triaged (that is, received advice or referral to a lower level of care than was needed) ranged from 0.8% to 18%. The proportion of calls that were considered to have been over-triaged (that is, received advice or referral to a higher level of care than was needed) ranged from 5% to 22%.
- Callers reported a consistently high level of satisfaction. All countries noted a steady increase in calls to the service over time.
- The evidence suggests that there are many factors, unique to each country, interacting with each other that can impact on the performance of a telephone service. While acute, non-urgent telephone services can, and do, positively assist callers at an individual level to access timely assistance and appropriate care, the evidence is mixed regarding their impact on broader system-level outcomes.
- While international experience suggests that telephone services for acute, non-urgent care are becoming increasingly common, the evidence base for their effectiveness remains limited and mixed. Our scoping review

highlighted a lack of robust, synthesised evidence regarding the impact of such services on health system performance, resource use, and patient outcomes.

- A budget impact analysis (BIA) was undertaken to estimate the cost of implementing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland. Only direct medical costs to the HSE were estimated, and included staffing; staff training and support; office set-up; hardware; software; public information campaign; and premises rent. The BIA projected costs over a five-year time horizon.
  - The estimated five-year total budget impact of implementing an alternative telephone service on a 24/7 basis staffed by non-clinical call handlers was estimated to range from €81.7 million (low-demand; 270,000 calls per year) to €254.2 million (high-demand; 960,000 calls per year). The average cost per call was approximately €55 per call and €48 per call for low and high demand scenarios, respectively. Economies of scale were evident, with higher call volumes reducing per-call costs, making a high-demand model more cost efficient.
  - Staffing costs were consistently identified as the dominant cost driver, accounting for between 72% and 82% of total costs across all scenarios (differing level of demand, staffing configurations, and operating hours).
  - Using non-clinical call handlers would lead to higher overall staffing costs because additional clinical staff are needed to manage escalated calls. By staffing only clinical call handlers, all calls are handled directly, reducing the total workforce required. The estimated overall five-year budget impact for the clinical call handler model ranged from €70.9 million to €217.0 million. The average cost per call was approximately €48 per call and €41 per call for low and high-demand scenarios, respectively.
  - Compared with a 24/7 model, costs associated with an OOH model are significantly lower, primarily due to reduced opening hours, necessitating fewer staff overall. The estimated overall five-year budget impact for the OOH model ranged from €34.5 million to €135.2 million.
  - The budget impact analysis also highlights the significant upfront investments required in hardware, software, office setup and the public information campaign.
- The design of an acute, non-urgent telephone service should take into account the existing ecosystem of health services in Ireland. A comprehensive understanding of the existing care pathways and the interactions among

urgent care and primary care services and the telephone service would be necessary as some reorganisation within these existing services may be required in order to improve system efficiency and patient experience. Key design decisions include:

  - Service operating hours: whether the service is available 24/7 or at specific times only, such as evenings and weekends. This would have implications for staff rostering and the recruitment burden (and overall costs) given the need to ensure adequate numbers of call operators are available to meet demand. Limiting availability may restrict access for individuals requiring non-urgent medical care during daytime hours and create lack of clarity as to when the service is available.
  - Staffing model: whether the service is staffed by clinical or non-clinical operators. There is potential for significant recruitment challenges due to workforce shortages if clinical call handlers are used. Diverting a clinically-trained workforce from front-facing care could be considered an inefficient use of resources if the service does not reduce demand for direct patient-facing care. However, it may be efficient if the service successfully reduces duplication by directing patients to the most appropriate setting.
  - Scope of services: Whether the service includes specialist supports (for example, mental health or dental services), as this would require specifically trained staff for these functions.

- The provider of an acute, non-urgent telephone service would need to outline well-defined implementation steps, such as recruitment of suitable staff, obtaining an appropriate clinical decision support system (CDSS) software to support assessment and management of calls, and obtaining premises from which this centralised national number will operate. The performance of this service should be subject to ongoing monitoring and evaluation, to ensure the service is safe, effective, meeting needs and uses resources efficiently.
- A telephone service for acute, non-urgent medical care needs in the pre-hospital setting could offer benefits and support to individuals who have difficulty accessing healthcare services currently, by providing free-to-access advice and guidance without appointment or the need to travel.
- If steps are not taken to manage access for those who are deaf, hard of hearing or those with a speech impairment or language barriers, existing health disparities could be exacerbated.

- Adding another layer to the health system may compound issues of inefficiency, duplication, and unnecessary use of resources, particularly in the Irish context where the available services are currently highly fragmented with limited connectivity.
- It is unclear from this assessment in which direction resource usage would shift. Decisions about healthcare distribution should ensure that resources are allocated or reallocated fairly, and that the opportunity costs (the value of the next best alternative forgone) of new investments are considered. This may prove difficult as there may be many competing claims requiring prioritisation of care.

Arising from the findings of this HTA, HIQA's advice to the Minister for Health and the HSE regarding the provision of a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland is as follows:

- It may be challenging for people to know the difference between an urgent and a non-urgent medical care need, or to know which healthcare service is the most appropriate for them to attend. The proposed telephone service would offer pre-hospital triage by trained operators, directing callers to the most appropriate service based on their symptoms with the aim of ensuring timely care in the right setting.
- Demand for primary care, emergency services and emergency departments (EDs) in Ireland is increasing, driven by factors including population growth and changing demographics.
- A review of countries that have implemented telephone services for acute, non-urgent medical care needs found that a common goal was to reduce ED visits. It was unclear from the review of evidence whether these telephone services have a positive impact on utilisation of primary care, ambulance services, and EDs. Despite the unclear evidence on resource utilisation, the international evidence does suggest that these services do provide value at the individual level by helping callers access timely assistance and appropriate care.
- For a 24/7 service using non-clinical call handlers with clinical support, the estimated total five-year budget impact ranged from €82 million (low-demand: 270,000 calls per year) to €254 million (high-demand: 960,000 calls per year), with an average cost per call of €55 and €48, respectively. This wide range reflects the substantial uncertainty around the potential demand for the service. Staffing was the main cost driver, accounting for 72% to 82% of total costs across all scenarios. Across scenario analyses,

the overall budget impact analysis ranged from €34.5 million to €254.2 million depending on differing assumptions regarding demand, staffing configurations and operating hours.

- Significant recruitment challenges are likely, particularly for clinical call handlers, given the existing shortages of healthcare staff. Establishing this telephone service could exacerbate current workforce pressures by drawing clinical staff away from frontline care. Recruitment difficulties may also arise for non-clinical call handlers.
- The proposed telephone line is intended to support individuals to navigate the healthcare system, as the available services are currently highly fragmented with limited connectivity. Such a telephone service would require close integration with existing services to avoid duplication and unnecessary use of resources.

Executive Summary

A health technology assessment (HTA) is intended to support evidence-based decision-making with regard to the optimum use of resources in healthcare services. Measured investment and disinvestment decisions are essential to ensure that overall population health gain is maximised, particularly given finite healthcare budgets and increasing demands for services provided. The aim of this HTA was to assess the requirements for the provision of a national telephone service (distinct from the existing 112/999 emergency service) for acute, non-urgent care needs in the pre-hospital setting in Ireland. This assessment provides advice to inform decision-making by the Minister for Health and the Health Service Executive (HSE).

1 Background

Within the context of the pre-hospital setting, acute, non-urgent care needs are defined as medical care needs where the investigation or intervention for an injury or illness could be safely deferred or where the care needs could be managed in a setting other than the emergency department (ED) or by contacting emergency services. These alternative healthcare settings include primary care or other community-based services. For individuals seeking healthcare, it may be difficult for them to distinguish between medical care needs that require urgent medical attention, and those that are acute, but non-urgent.

Currently in Ireland, people have a range of options to access publicly-funded healthcare, including:

- through their general practitioner (GP) during office hours or ringing GP out-of-hours (OOH) services
- self-presenting at an injury unit
- self-presenting at an ED
- ringing 112/999 to access emergency ambulance services.

People also have the option to visit a community pharmacy where they can obtain advice, receive treatment for a minor illness, or be redirected to other primary care or urgent care services.

When primary care services and injury units cannot be readily accessed, people with acute, non-urgent care needs who wish to access healthcare, but who are unwilling or unable to wait, must either self-present to hospital EDs or call 112/999 for an emergency ambulance in order to access healthcare. This has contributed to an increased burden on emergency services and EDs. Under the current pathway, there may also be people who require urgent care, but who defer attending the ED as

they do not think this level of care is necessary or because they expect long waiting times.

2 Description of the technology

The proposed telephone service in Ireland would operate as a triage system in the pre-hospital setting. It would involve trained operators taking calls from people who believe they have an acute, non-urgent medical care need. The call operators would provide telephone triage and redirect callers to the most appropriate healthcare setting based on their described symptoms. This would include seamless transfer of the call between 112/999 services and the acute, non-urgent telephone service, where clinically indicated. Provision of an acute, non-urgent telephone service is intended to support the timely provision of care in the most appropriate setting, which may include advice for self-care and does not necessarily involve referral to a healthcare provider.

Telephone services for acute, non-urgent care are an increasingly prevalent feature of healthcare delivery internationally. A review was undertaken of acute, non-urgent telephone services implemented in Organisation for Economic Co-operation and Development (OECD) countries (38 member states including the UK, equating to 41 countries). Of these 41 countries, 22 have implemented these telephone services, with the longest-standing service operational since 1998. Across these countries, implementation of these telephone services has differed with regard to aspects such as:

- provision in conjunction with OOH primary care services
- use of trained operators and the grades of staff
- implementation at a national or regional level
- provision in conjunction with an additional digital service.

3 International scoping review of the use and impact of acute, non-urgent telephone services

A scoping review of international practice was undertaken to assess the evidence for the impact on health outcomes and healthcare delivery for any identified telephone services (distinct from the 112/999 emergency services) for acute, non-urgent medical care needs in the pre-hospital setting. Seventy-one primary research studies were included, with studies identified from 11 countries (Belgium, Denmark, Finland, Sweden, England, Scotland, Switzerland, Australia, Canada [Alberta], Japan and New Zealand). These countries differed with respect to their existing healthcare system in which the telephone service was implemented, the maturity of the service, and the level of analysis conducted on the service. However, the main objective for implementing an acute, non-urgent telephone service was broadly similar across

countries, that is, to reduce ED attendance, and to improve access to timely assistance and appropriate care.

Studies from five countries reported the impact on ED attendances. Two countries reported a positive effect (avoidance of unnecessary resource use, decreased demand), while three countries reported either no effect or conflicting findings. As such, the international evidence did not clearly demonstrate whether a telephone service leads to reductions in ED attendances. Moreover, there was conflicting evidence of the impact of a telephone service on ambulance and primary care utilisation.

Across the included studies, the largest user subgroup of callers was those aged 20–65 years followed by people aged 0–20 years and finally those aged 65 years and older. In the paediatric population, calls were most frequently in relation to one- to four-year-olds. Callers reported a consistently high level of satisfaction. Satisfaction was affected by call waiting times, communication style and clarity, caller expectations, and the extent to which they agreed with the advice received.

All countries noted a steady increase in calls to the service over time. However, service targets were consistently missed with respect to answering calls within specified timeframes and minimising the number of abandoned calls. Callers to acute, non-urgent telephone services were typically advised to visit their GP (9% to 69%), attend the ED (5% to 49%), or were given self-care advice (7% to 51%). Reasons for service use included the convenience and accessibility of telephone triage and the ability to obtain advice without an appointment. Barriers to its use included having readily accessible GP or ED services in the area, difficulty in communicating an illness over the phone, and a lack of knowledge and awareness of how to access the services. In addition to their impact on ED services, introducing an acute, non-urgent telephone service may affect other health system stakeholders including primary care, out-of-hours services, and ambulance services. Unless a call is closed with self-care advice, the outcome of a call may be a shift in resource use among different healthcare settings.

Considering the impact of acute, non-urgent telephone services on safety, the proportion of calls that were considered to have been under-triaged (that is, received advice or referral to a lower level of care than was needed) ranged from 0.8% to 18%. The proportion of calls that were considered to have been over-triaged (that is, received advice or referral to a higher level of care than was needed) ranged from 5% to 22%. Across countries, studies reported high levels of compliance with triage advice. The factors affecting compliance were the time of the call, socioeconomic status of the caller, and the advice given.

Complexities in estimating costs of acute, non-urgent telephone services included a lack of robust data about the resources required to provide the service; set-up and ongoing running costs of the service; software costs; and measurable health outcomes. It was noted that there is a difficulty in calculating initial set-up costs where existing infrastructures are used. Where existing infrastructures are used, changes in how services are delivered limit the ability to compare with brand new services.

The evidence suggests that there are many factors, unique to each country, interacting with each other that can impact on the performance of a telephone service. Given the array of between-country and between-study differences, there is conflicting evidence regarding the impact of a telephone service on overall healthcare utilisation; however, there is evidence at the individual level that telephone services can, and do, positively assist callers to access timely assistance and appropriate care. Although telephone services for acute, non-urgent care are increasingly used internationally, evidence regarding their effectiveness remains limited and inconsistent. Our scoping review identified a lack of high-quality, synthesised data on their impact on system performance, resource use, and patient outcomes.

4 Epidemiology and burden of disease

The target population for a telephone service in Ireland includes the general population with acute, non-urgent medical care needs, encompassing those who use primary and secondary care services or who face barriers to accessing care. Demand for healthcare services in Ireland has increased due to population growth and changing demographics. The population, particularly those aged 65 and older, is projected to increase significantly, further driving this demand.

Demand for healthcare services in Ireland has increased due to population growth and an ageing demographic. In addition, broader health reforms such as Sláintecare are contributing to shifts in how and where care is accessed. While Sláintecare aims to reduce pressure on hospital services by strengthening primary care, this transition may lead to increased demand in primary care. The demand for GP OOH services is significant, with 1.1 million contacts in 2023 across 17 GP OOH services participating in the HSE grant-funded cooperative schemes, averaging 21,500 contacts per week. This represented an increase of 19% in annual contacts since 2014.

The Emergency Call Answering Service reported a 35% increase in the volume of calls received requesting emergency services from 2017 to 2023, with a 67% increase in the number of connected calls for emergency ambulance services over the same period. Demand for national ambulance service emergency ambulances in Ireland increased by 23% from 2017 to 2022, with 384,000 calls in 2022. The

number of medical incidents requiring ambulance dispatch also increased over the same period from 228,000 medical incidents in 2017 to 293,000 in 2022, an increase of 29%. Demand for Dublin Fire Brigade ambulance services increased by 12.1% from 2014 to 2023, with 80,916 incidents in 2023. In 2023, low-acuity calls constituted approximately 20% of these incidents, with more than one fifth of these not requiring hospital transfer.

ED attendances in publicly-funded hospitals in Ireland increased by 21.4% from 2016 to 2023, reaching 1.48 million, with higher utilisation among young children and older adults. The Irish Children's Triage System and Manchester Triage System, used to prioritise patients, showed that from 2022 to 2024, 23% of attendances were classified as 'Standard' or 'Non-Urgent.' These lower-acuity cases, which often do not require hospital admission, highlight the potential for managing many of these patients in other more appropriate healthcare settings.

OECD data show that rates of GP and ED visits in Ireland are broadly similar to the OECD average. Additionally, international studies indicate that 13.5% to 40.0% of ED attendances are potentially inappropriate, similar to findings in Ireland.

When estimating the projected volume of callers to an acute, non-urgent telephone service in Ireland, consideration was given to each of the existing public healthcare options that are available to people at present, noting that a proportion of people who are currently using each of these services could potentially switch to using an acute, non-urgent telephone service. It is important to recognise that these projections are approximations, and actual demand could be significantly higher than anticipated, particularly as awareness of the service grows. Moreover, it is noted that the sources to describe the epidemiology may have relied on self-reported data and surveys, while others may exclude data in relation to patients who pay out of pocket or attend private healthcare facilities. The projected annual demand for an acute, non-urgent telephone service is between approximately 270,000 to 960,000 calls. However, this wide range reflects the inherent uncertainty in the estimate, and the actual demand will depend on the specific services offered by the telephone service and their acceptability to users.

5 Organisational considerations

The design of an acute, non-urgent telephone service should take into account the existing ecosystem of health services in Ireland. A comprehensive understanding of the existing care pathways and the interactions among urgent care and primary care services and the telephone service is necessary as some reorganisation within these existing services may be required in order to improve system efficiency and patient experience. If an acute, non-urgent telephone service were to be introduced in

Ireland, consideration would also have to be given to how much information the call operator would have in terms of the availability and capacity of other health services. If the system can cooperate with existing health services in a meaningful way and actively assist the caller to receive timely care in the most appropriate setting, then it is more likely to have greater perceived utility to the caller, leading to sustained demand. Of note, the introduction of an acute, non-urgent telephone service could create supplier-induced demand, thereby increasing overall demand for primary and urgent care services, as a telephone service would not have an associated cost to the caller.

Core requirements of an acute, non-urgent telephone service would include tailored clinical decision support system (CDSS) software to support assessment and management of calls. CDSS software is designed to ensure consistency and safety by standardising, controlling, and monitoring the clinical knowledge in play for call operators. Public awareness of what they can expect when they call an acute, non-urgent telephone service and what is outside the scope of the service is another core requirement. Key features, from a caller perspective, include an easy-to-remember number, minimal wait times to speak to an operator, and actionable advice on the appropriate care pathway.

In designing an acute, non-urgent telephone service, consideration would need to be given to whether non-clinical or clinically-trained call operators would be used. There is potential for significant recruitment challenges due to workforce shortages if clinical call handlers are used. Diverting a clinically-trained workforce from front-facing care could be considered an inefficient use of resources if the service does not reduce demand from direct patient-facing care. However, it may be efficient if the service successfully reduces duplication by directing patients to the most appropriate setting. Use of a non-clinical workforce is likely to be associated with significant resource and training support requirements. A third option is to combine lay expertise (call operators) and professional expertise (clinical advisors) supported by a CDSS. Consideration would also have to be given to any specialist services (for example, mental health or dental services) that may be provided by the service, as this would require specifically trained staff for these functions.

Another key consideration in the staffing of an acute, non-urgent telephone service would be whether the service would operate 24/7 or at specific times only, such as evenings and weekends. This would have implications for rostering of staff and the recruitment burden (and overall costs) given the need to ensure adequate numbers of call operators are available to meet demand. Limiting availability may restrict access for individuals requiring non-urgent medical care during daytime hours and create lack of clarity as to when the service is available.

The anticipated demand for an acute, non-urgent telephone service is likely to be impacted by a number of aspects: the level of interaction between the service and other healthcare delivery services in the healthcare system; what additional supports are provided through the telephone service; whether the telephone service is operated by a non-clinical or clinically-trained workforce; and whether it operates 24/7 or at specific times only. A large portion of demand is also anticipated to come from currently unmet demand.

The aim of an acute, non-urgent telephone service in Ireland would be to support the provision of timely care in the most appropriate setting, and the design of the service must reflect this aim. The provider of an acute, non-urgent telephone service would need to outline well-defined implementation steps, such as recruitment of suitable staff, obtaining an appropriate CDSS system, obtaining premises from which this centralised national number will operate, and most importantly, attempting to integrate and cooperate with existing primary care and urgent care services. It will be necessary to consult with stakeholders from other areas of the healthcare service who may be impacted by the introduction of this intervention, such as primary care and urgent care services, along with the general public. The performance of this service should be subject to ongoing monitoring and evaluation, to ensure the service is safe, effective, meeting needs and uses resources efficiently.

6 Budget impact analysis

A budget impact analysis (BIA) was undertaken to estimate the costs of implementing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland. Only direct medical costs to the HSE were estimated, and included staffing; staff training and support; office set-up; hardware; software; public information campaign; and premises rent. The BIA projected costs over a five-year time horizon.

For the base-case scenario, it was assumed that the acute, non-urgent telephone service would operate 24 hours a day, seven day a week, with call handling performed by non-clinical call handlers, supported by nursing and other clinical staff (for example, doctors, dentists, pharmacists) where appropriate. The projected annual demand for an acute, non-urgent telephone service was derived from current service usage across various healthcare settings in Ireland. The projected annual demand for a base-case telephone service is estimated to range from 270,000 (low-demand) to 960,000 calls (high-demand). The estimated five-year total budget impact of implementing a telephone service for acute, non-urgent medical care needs was estimated to range from €81.7 million (low-demand) to €254.2 million (high-demand). The estimated average cost per call for a 24-hours-a-day, seven-day-a-week service staffed by non-clinical call handlers was approximately €55 per

call for the low-demand scenario and €48 per call for the high-demand scenario. If clinical call handlers replaced non-clinical staff, the estimated five-year total budget impact was €70.9 to €217.0 million.

The sensitivity analysis provided an estimated range of inferred demand for the OOH service model operating from 6pm to 8am Monday to Friday and 24 hours a day on weekends. The estimated demand for this service ranged from 120,000 to 200,000 calls per year in lower projections and from 420,000 to 710,000 calls per year in higher projections. Compared with a 24/7 model, costs associated with an OOH model are significantly lower, primarily due to reduced opening hours, necessitating fewer staff overall. In the low-demand scenario, total costs for an OOH service with non-clinical call handlers were projected to be between €37.7 million and €50.9 million, representing a reduction of 38% to 54% relative to the fully-operational 24/7 service. If clinical call handlers replaced non-clinical staff in the OOH model, costs were estimated to range from €34.5 million to €44.9 million. In the high-demand scenario, total costs ranged from €87.6 million to €135.2 million if staffed by non-clinical call handlers representing a 47% to 66% reduction in costs compared to a fully-operational 24/7 service. If clinical call handlers were used instead, the cost of the OOH service was estimated to range from €76.2 million to €117.1 million (high-demand). The estimated cost per call for these scenarios ranged from €30 to €57 per call.

The scenario analyses highlight financial trade-offs associated with staffing grades and operational schedules. Staffing costs were consistently identified as the dominant cost driver, accounting for between 72% and 82% of total costs across all scenarios. Economies of scale were evident, with higher call volumes reducing per-call costs and making a high-demand model more cost efficient. Using non-clinical call handlers would lead to higher overall staffing costs because additional clinical staff are needed to manage escalated calls. By staffing only clinical call handlers, all calls are handled directly, reducing the total workforce required.

While use of clinical call handlers may provide qualitative benefits and their inclusion results in cost decreases, there would likely be significant recruitment challenges due to workforce shortages. Operating an OOH service substantially reduced costs, but limiting service availability to evenings and weekends could restrict accessibility for individuals requiring non-urgent medical care during daytime hours. Additionally, the BIA also highlights the significant upfront investments in hardware, software, office setup and the public information campaign.

There was a high degree of uncertainty in relation to the projected call volumes underpinning the staffing estimates. These projections relied on assumptions about shifts in healthcare utilisation, the proportion of contacts transitioning from other

services and potential demand fluctuations due to latent and or supplier-induced demand. An increase in demand for the acute, non-urgent telephone service directly translates into higher costs, with an additional 100,000 calls per year above the high-demand estimate adding approximately €5 million annually to the budget. The integration of additional clinical and specialist roles into the service may be feasible without substantially increasing the financial projections. However, decisions regarding staffing models, operating hours, and service scalability must align with broader healthcare priorities, such as equity, access, and patient satisfaction. The financial trade-offs highlighted in this analysis have significant policy implications, particularly in ensuring that any new service is both cost efficient and effectively integrated into the existing healthcare system.

7 Patient, social, ethical and legal considerations

A telephone service for acute, non-urgent medical care needs in the pre-hospital setting could offer benefits and support to individuals who have difficulty accessing healthcare services currently, by providing free-to-access advice and guidance without appointment or the need to travel. An acute, non-urgent telephone service would offer tailored advice based on the individual's symptoms and medical history, ensuring that callers receive guidance that aligns with best medical practice. This personalised approach may lead to accessing care at a more appropriate health service and potentially better management of care for the individual.

The absence of a shared electronic health record is a risk to the individual; this absence may also pose a risk to the wider health service. Introducing an additional layer to the health system could exacerbate issues of inefficiency, duplication, and unnecessary use of resources, particularly in Ireland, given the fragmented and disconnected nature of existing services. If steps are not taken to manage access for those who are deaf, hard of hearing or those with a speech impairment or language barriers, existing health disparities could be exacerbated.

This technology will potentially result in directing people to use healthcare services who would otherwise have delayed or foregone care in the absence of the phone line. All countries that have implemented an acute, non-urgent telephone service have seen an increase in calls over time. Currently in both primary care and EDs, demand exceeds capacity. Without provision of additional resources in these settings, there is a risk that the acute, non-urgent telephone service could create additional challenges in meeting demand, leading to frustration for service users and providers. As the international evidence shows that an acute, non-urgent telephone service would refer people to GP services, if there is no capacity in that setting, then the telephone service would be unable to fulfil its purpose, and frustration with the health service would likely grow.

It is unclear from this assessment in which direction resource usage would shift. Decisions about healthcare distribution should ensure that resources are allocated or reallocated fairly, and that the opportunity costs (the value of the next best alternative forgone) of new investments are considered. This may prove difficult as there may be many competing claims requiring prioritisation of care. Funding interventions that do not represent an efficient use of resources can create issues of justice and equity with respect to a fair distribution of benefits and burdens. The high costs and potential for shifting demand rather than reducing it must be carefully weighed against the expected benefits, especially in the context of a finite healthcare budget.

If the telephone service is integrated into the functions of an existing organisation, an amendment to legislation could be required. If the service is set up as an independent organisation, new legislation would likely be required.

8 Conclusions

Telephone services for non-urgent medical care are becoming increasingly common across OECD countries, with 22 nations implementing such services. The aim is typically to reduce ED visits and to provide timely, appropriate care. A scoping review of services in Denmark, Sweden, England, Scotland, and Australia highlighted similarities with Ireland's healthcare system, such as public funding and challenges like rising demand and ageing populations. These countries, however, differ in their funding models, healthcare delivery, and governance. Common user demographics include females and caregivers, with the majority of calls coming from those aged 20-65 years. Users typically call for advice on managing illness rather than injury, and most calls are made outside of regular office hours. It was unclear from the review of the international evidence whether these telephone services have a positive impact on utilisation of primary care, ambulance services, and EDs. Despite the unclear evidence on resource utilisation, the international evidence does suggest that these services provide value at the individual level by helping callers access timely assistance and appropriate care.

Implementing an acute, non-urgent telephone service in Ireland would require careful consideration of several service design features, including staffing, operational hours, and integration with existing services. Staffing costs are the primary financial driver, with limited opportunity to reduce the cost of the service due to alternative staffing models, such as use of clinical instead of non-clinical operators to handle calls. The budget impact analysis estimates a potential five-year cost ranging from €81.7 million to €254.2 million for a 24/7 service staffed by non-clinical call handlers, depending on demand, highlighting the financial implications of its introduction. Operational models that limit service hours to evenings and

weekends could reduce the cost of delivering the service, but may limit accessibility for non-urgent care during the day. Across scenario analyses, the overall budget impact analysis ranged from €34.5 million to €254.2 million depending on differing assumptions regarding demand, staffing configurations and operating hours.

While an acute, non-urgent telephone service could improve access to care, its success in Ireland may be influenced by factors such as effective integration with existing services, clear public communication, and the management of the financial and resource implications. Ensuring the service is targeted toward acute, non-urgent medical needs rather than general health inquiries would be critical to avoiding unnecessary costs and service congestion. The high costs and potential for shifting demand rather than reducing it would need to be carefully weighed against the expected benefits, especially in the context of a finite healthcare budget. Such a telephone service would require close integration with existing services to avoid duplication and unnecessary use of resources.

Plain language summary

- What did we look at?

  We assessed a telephone service that would provide medical advice and guidance for people with acute non-urgent care needs. These are medical issues that require attention, but are not emergencies and may not need hospital care. It might be possible to get care from a general practitioner (GP) or to manage the problem without the need for a medical professional.

  Examples of acute, non-urgent medical care needs include cold and flu symptoms, a fever, or minor burns. It can be difficult for people to know whether their condition is urgent or non-urgent. Sometimes, people go to the hospital or call emergency services (112/999) when they do not need to. This can put a strain on emergency services. In other cases, people might avoid getting help because they are not sure where to go. A dedicated telephone service could guide callers on the best place to go in their particular situation. Like 112/999, the service would be free to call.

- Do similar telephone services exist in other countries?

  Several countries have similar telephone services, including the UK, Sweden and Denmark. International experience shows that these services can help people to get timely and appropriate care outside of hospital settings. Our review of these services showed that differences in the healthcare systems and how the service is run can affect how well an acute, non-urgent telephone service works.

- What did we find?

  An acute, non-urgent telephone service could help people who are unsure of how to deal with a medical issue, or face difficulties in seeing a GP. It is difficult to know how many people would use a telephone service in Ireland. Based on the number of people currently using different frontline services in Ireland and international experience of these telephone services, we estimated that the number of calls could range between a quarter of a million and one million calls a year. It would be important to decide whether the phone line would be available 24 hours a day, or just at nights and on weekends. The people answering calls could be trained staff, nurses or doctors. However, using nurses and doctors as call operators would take them away from treating patients. Depending on how many people call and how the service is operated, it would cost between €35 million to €250 million

over five years to provide the service.

If the telephone service is not linked to other services, like GPs and hospitals, then it may give advice that the caller cannot follow. For example, if a caller is advised to visit the GP within the next couple of days, but cannot access a service or an appointment. Clear public communication would be essential to ensure that people understand when and how to use the service appropriately. If the service is brought in, it would have to be usable for people who are deaf, hard of hearing or have speech impairments, those with language barriers, and those with limited access to telephones.

List of abbreviations used in this report

CDSS	clinical decision support software
CHO	Community Health Organisations
DFB	Dublin Fire Brigade
EAG	Expert Advisory Group
ECAS	Emergency Call Answering Service
ESRI	Economic and Social Research Institute
ED	emergency department
GP	general practitioner
HIQA	Health Information and Quality Authority
HSE	Health Service Executive (Ireland)
HTA	health technology assessment
ICGP	Irish Congress of General Practitioners
MRHT	Midlands Regional Hospital Tullamore
NAS	National Ambulance Service
NEOC	National Emergency Operations Centre
OECD	Organisation for Economic Co-operation and Development
OOH	out-of-hours
PET	patient experience time
PHECC	Pre-Hospital Emergency Care Council
PSI	Pharmaceutical Society of Ireland
SJUH	St. James's University Hospital
SVUH	St. Vincent's University Hospital
UHK	University Hospital Kerry
UHL	University Hospital Limerick

1 Introduction

1.1 Background to the request

Within the context of the pre-hospital setting, acute, non-urgent care needs are defined as medical care needs where the investigation or intervention for an injury or illness could be safely deferred or where the care needs could be managed in a setting other than the emergency department (ED) or by contacting emergency services. These alternative healthcare settings include primary care or other community-based services. For individuals seeking healthcare, it may be difficult for them to distinguish between medical care needs that require urgent medical attention, and those that are acute, but non-urgent. Depending on the context of the individual, there may be overlap in terms of the symptoms experienced and the perceived urgency.[1] Where it is up to the individual to determine their point of entry into the healthcare system, this may be informed by their perceived level of urgency of their particular healthcare need.

Currently in Ireland, people have a range of options to access publicly-funded healthcare, including:

- through their general practitioner (GP) during office hours or ringing GP out-of-hours services
- self-presenting at an injury unit
- self-presenting at an ED
- ringing 112/999 to access emergency ambulance services.[2]

People also have the option to visit a community pharmacy where they can obtain advice, receive treatment for a minor illness, or be redirected to other primary care or urgent care services. In situations where primary care and Injury Units are not easily accessible, individuals with acute, non-urgent healthcare needs who are unwilling or unable to wait for care often resort to attending hospital EDs or calling emergency services. Additionally, some individuals who do need urgent care, may delay seeking help, either due to perceptions that ED attendance is unnecessary or concerns about prolonged waiting times. Provision of an acute, non-urgent telephone service is intended to support the timely provision of care in the most appropriate setting.

In light of the above issues, the Health Service Executive (HSE) requested that the Health Information and Quality Authority (HIQA) carry out a health technology assessment (HTA) of providing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting. This request was subsequently prioritised for

inclusion in the HIQA HTA work plan. The aim of the HTA was to establish the safety, clinical effectiveness, efficiency and economic impact of providing a telephone service for individuals with acute, non-urgent medical care needs in the pre-hospital setting in Ireland. It also assessed the organisational, social, legal and ethical issues associated with such a decision. Based on the available evidence, the HTA provides advice to inform decision-making by the Minister for Health and the HSE.

1.2 Terms of reference

The purpose of the HTA was to provide advice to the Minister for Health and the HSE on the requirements for the national provision of an acute, non-urgent telephone service, distinct from the 112/999 emergency services, operating in the pre-hospital setting in Ireland. Following an initial scoping of the available evidence, the terms of reference of this assessment were agreed between HIQA and the HSE.

Considering people with acute, non-urgent care needs in the pre-hospital setting in Ireland, the terms of reference for this HTA were to:

- describe the current pathways to access publicly-funded healthcare
- describe the existing and projected demand and burden on current pathways
- review international practice relating to the implementation of a second telephone service distinct from the 112/999 emergency services
- review the current evidence of the safety, clinical effectiveness, efficiency and cost effectiveness of providing a second telephone service
- assess the budget impact of providing a second telephone service
- consider any potential organisational and resource implications of providing a second telephone service
- consider any patient and social implications that providing a second telephone service may have for patients, the general public or the healthcare system in Ireland
- consider any ethical and legal implications that providing a second telephone service may have
- based on the evidence in this assessment, provide advice to the Minister for Health and the HSE to support a decision on whether to provide a second telephone service.

1.3 Overall approach

HIQA appointed an evaluation team comprising staff from the HTA Directorate to carry out the assessment.

HIQA convened an Expert Advisory Group (EAG) comprising representation from relevant stakeholders including patients, decision-makers, clinical experts, public health experts and methodological expertise. The role of the EAG was to inform and guide the process, provide expert advice and information, and to provide access to data where appropriate. A full list of the membership of the EAG is available in the acknowledgements section of this report.

The terms of reference for the EAG were to:

- contribute to the provision of high-quality and considered advice by HIQA to the Minister for Health and the HSE
- contribute fully to the work, debate and decision-making processes of the group by providing expert guidance, as appropriate
- be prepared to provide expert advice on relevant issues outside of group meetings, as requested
- provide advice to HIQA regarding the scope of the analysis
- support the evaluation team led by HIQA during the assessment process by providing expert opinion and access to pertinent data, as appropriate
- review the project plan outline and advise on priorities, as required
- review the draft report from the evaluation team and recommend amendments, as appropriate
- contribute to HIQA's development of its approach to HTA by participating in an evaluation of the process on the conclusion of the assessment.

The terms of reference of the HTA were reviewed by the EAG at its first meeting. A description of the current pathways to access publicly-funded healthcare in Ireland along with a scoping review of international practice relating to the implementation of a telephone service (distinct from the 112/999 emergency service) for acute non-urgent conditions in a pre-hospital setting were also circulated and reviewed at this meeting. Draft versions of the individual chapters and the completed report were circulated for review by the EAG in advance of each meeting and amended, as appropriate. A draft report was published for public consultation and was subsequently amended, as appropriate before recirculation for review by the EAG. Details of the public consultation are provided in the separate statement of outcomes report. The final report was submitted to the Board of HIQA for approval. Following its approval, the completed assessment is submitted to the Minister for Health and the HSE as advice and published on the HIQA website.

2 Description of the technology

Key points

- At present in Ireland, people have a range of options to access publicly-funded healthcare, including: general practitioner (GP) during office hours, out-of-hours primary care, 112/999 phone line for emergency ambulance services, self-presenting at an injury unit, self-presenting at a hospital emergency department (ED). People also have the option to visit a community pharmacy where they can obtain advice, receive treatment for a minor illness, or be redirected to other primary care or urgent care services.
- When primary care services and injury units cannot be readily accessed, people with acute, non-urgent medical care needs, who are unwilling or unable to wait, must either self-present to hospital EDs or call the emergency services contact number in order to access healthcare. This has contributed to an increased burden on emergency services and on EDs.
- Provision of an acute, non-urgent telephone service is intended to support the timely provision of care in the most appropriate setting.
- The proposed acute, non-urgent telephone service in Ireland would operate as a triage system in the pre-hospital setting. It would involve trained operators taking calls from people who believe they have an acute non-urgent care need. The call operators would provide telephone triage and redirect callers to an appropriate healthcare setting based on their described symptoms. This would include seamless transfer of the call between 112/999 services and the acute, non-urgent telephone service, where clinically indicated.
- A review was undertaken of telephone services for acute, non-urgent care implemented in OECD countries (38 member states including the UK, equating to 41 countries):
  - Telephone services have been implemented in 22 countries, with the first service operational since 1998
  - Countries differ in aspects of how the telephone services are implemented, including:
    - provision in conjunction with out-of-hours (OOH) primary care services
    - trained operators and the grades of staff
    - implementation at a national or regional level

- provision in conjunction with an additional digital service.

- A telephone service for acute, non-urgent medical care needs in the pre-hospital setting has the potential to optimise resources, minimise unnecessary visits to EDs and ensure individuals receive timely and appropriate care. There are many factors, unique to each country, interacting with each other which can impact on how a telephone service is designed and implemented.

2.1 Introduction

The technology considered in this HTA represents a system change, involving the potential introduction of a telephone service (distinct from the 112/999 emergency ambulance services), targeted at individuals with acute, non-urgent medical care needs in the pre-hospital setting in Ireland.[2] This chapter describes of the options currently available to access publicly-funded healthcare in the pre-hospital setting in Ireland. The proposed telephone service and the system change this technology represents is also outlined. In addition, an overview of identified telephone service options for acute, non-urgent medical care needs that are currently being implemented internationally is provided. Of note, in the literature the terms 'caller' and 'patient' are used interchangeably to refer to people who use 112/999 emergency services, people who contact an out-of-hours general practitioner (GP) service and people who use a telephone service to access acute, non-urgent medical care. Throughout this report, for the purposes of consistency, the term 'caller' will be used to refer to all such persons. The terms emergency department 'presentations' and 'attendances' are used interchangeably to refer to instances of individuals arriving at an ED, regardless of whether it is a first or repeat visit, or whether treatment is provided.

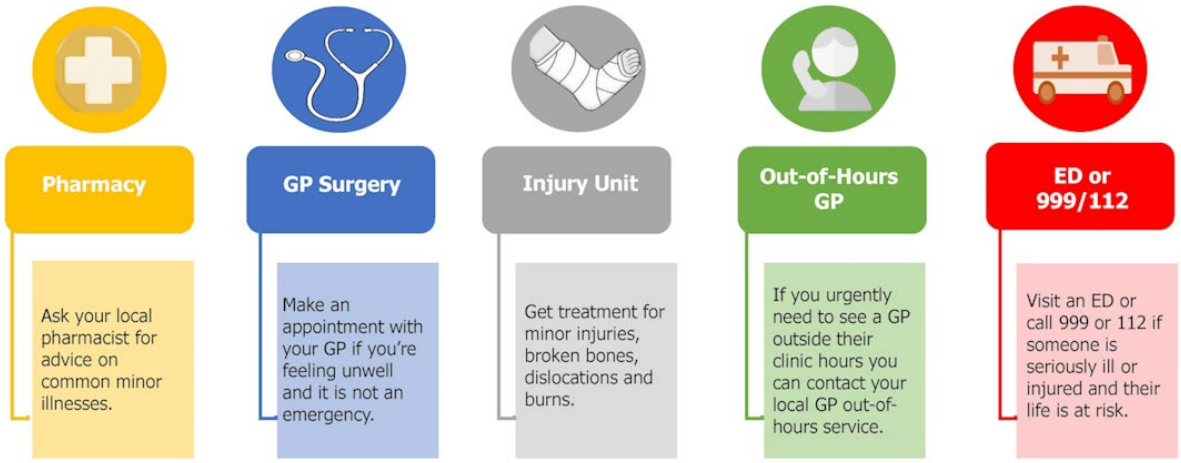
2.2 Current practice in Ireland

The rising demand for healthcare services, from a population that is getting older and has more complex healthcare needs, is placing considerable pressure on the Irish healthcare system. Currently in Ireland, people have a range of options to access publicly-funded healthcare, including:

- through their GP during office hours or ringing GP services out-of-hours
- self-presenting at an Injury Unit
- self-presenting at an emergency department (ED)
- ringing 112/999 to access emergency ambulance services.[2]

People also have the option to visit a community pharmacy where they can obtain advice, receive treatment for a minor illness, or be redirected to other primary care or urgent care services. An overview of these entry points to healthcare services is provided in Figure 2.1. These entry points are mutually exclusive with varying cost barriers for each service as detailed in Table 2.1.

Figure 2.1 Healthcare options currently available in Ireland



Key: ED – emergency department; GP – general practitioner.

Source: Adapted from Hse.ie

Table 2.1 Cost barriers for healthcare options currently available in Ireland

Type of Care	Full Medical Card Holders	GP Visit Card Holders	Private Patients
Community pharmacist consultation	Free of charge		
Office hours GP	Free of charge	Free of charge	Out-of-pocket fee average €50[3] (range: approximately €45 to €65)[4]
Out-of-hours GP	Free of charge	Free of charge	Out-of-pocket fee (range: approximately €50 to €100)*
Acute public hospital inpatient	Free of charge		

Type of Care	Full Medical Card Holders	GP Visit Card Holders	Private Patients
Acute public hospital outpatient (including emergency departments)	Free of charge	€100 fee+ Charge is not applicable to the following groups: ▪ People referred by GP ▪ People admitted to hospital after attending the emergency department ▪ People receiving treatment for prescribed infectious diseases – including coronavirus (COVID-19) ▪ Children, in respect of the following diseases and disabilities: "mental handicap, mental illness, phenylketonuria, cystic fibrosis, spina bifida, hydrocephalus, haemophilia and cerebral palsy" ▪ People who are entitled to hospital services because of EU Regulations	
Injury unit	Free of charge	€75 fee+ Charge is not applicable if you are referred by GP	
Other	Varied eligibility for prescription medicines, community, social care services, dental, ophthalmic and aural care		

Key: GP – general practitioner.
Source: Adapted from HSE.ie
* Estimate of fees from reviewing GP out-of-hours websites.
+This fee is a Government levy over which an individual ED, LUI or hospital have no control.

2.2.1 Primary care

Primary care in Ireland encompasses all health and social care services available in the community, outside of the hospital setting. Primary care providers include pharmacists, GPs, practice nurses and various other services (public health and community nurses, physiotherapists, occupational therapists, dentists, opticians and psychologists).

In Ireland, there are approximately 21 million GP consultations each year, equating to, on average, four visits per person.[5] Due to a lack of a central register for GPs and the nature of practice in Ireland with GPs operating independently, information about both GP numbers and the volume of general practice consultations is difficult to ascertain.[5] Approximately 42% of the Irish population qualify for free access to

general practice care as holders of either a General Medical Services (GMS) card (30.4%) or GP only card (known as a doctor visit card — DVC) (11.3%), with the remainder paying privately per visit to their GP.[6] The GMS scheme entitles patients with incomes below a threshold on a means-tested basis or with specified illnesses to free healthcare including medication. A DVC is limited to free GP access only and is offered to all those under the age of eight years, those over 70 years, those on Carer's Benefit or Carer's Allowance and on a means-tested basis for all others.

Out-of-hours (OOH) primary care is defined as care delivered outside 'normal working hours', when daytime family or general practice is closed, typically between 5pm (or 6pm) and 8am on weekdays, all weekend and on public holidays.[7, 8] It is not considered to be an emergency care service. In Ireland, the majority of OOH GP services operate from 6pm to 9am, Monday to Friday, and on a 24-hour basis over the weekend. As with GP services, those who do not qualify for free access must pay privately per contact with OOH primary care services. Since the late 1990s, general practice providers in Ireland have developed 17 OOH cooperatives, with 92 OOH services available. These cooperatives may differ in terms of the size of the area or population that they cover. Members of the public can choose which cooperative they call from a list of contact numbers on the HSE website. When a patient contacts the relevant OOH GP service, a non-clinical, trained call handler records the patient's details and symptoms in the electronic record and the case is prioritised as routine, urgent or emergency. Subsequently, a triage nurse calls the patient back and conducts a symptom-based assessment using a clinical decision support software (CDSS) system. Based on this assessment, the nurse determines the appropriate level of care, which could include nurse advice, doctor advice, scheduling an appointment with the OOH GP or referring the patient to the hospital. When a face-to-face consultation with the duty doctor is necessary, the consultation can take place at a treatment centre or in the patient's home or place of residence, such as a nursing home. Figure 2.2 illustrates the location of these services around the country. The cooperatives vary in terms of their approach to patient triage, availability of treatment centres and the provision of domiciliary visits, but no centralised data exist on their role in the management of emergencies in the community.[9, 10]

In October 2024, there were 1,905 retail pharmacy businesses registered with the Pharmaceutical Society of Ireland (PSI), with 5,256 registered pharmacists reporting that they work in community pharmacy.[11] All pharmacies in Ireland are required to have a consultation area for patient-pharmacist consultations.[12] Pharmacy consultations refer to the provision of health advice by pharmacists, including advice given while attending for prescription or over-the-counter medicines, health screening or vaccinations.[12]

2.2.2 Injury units

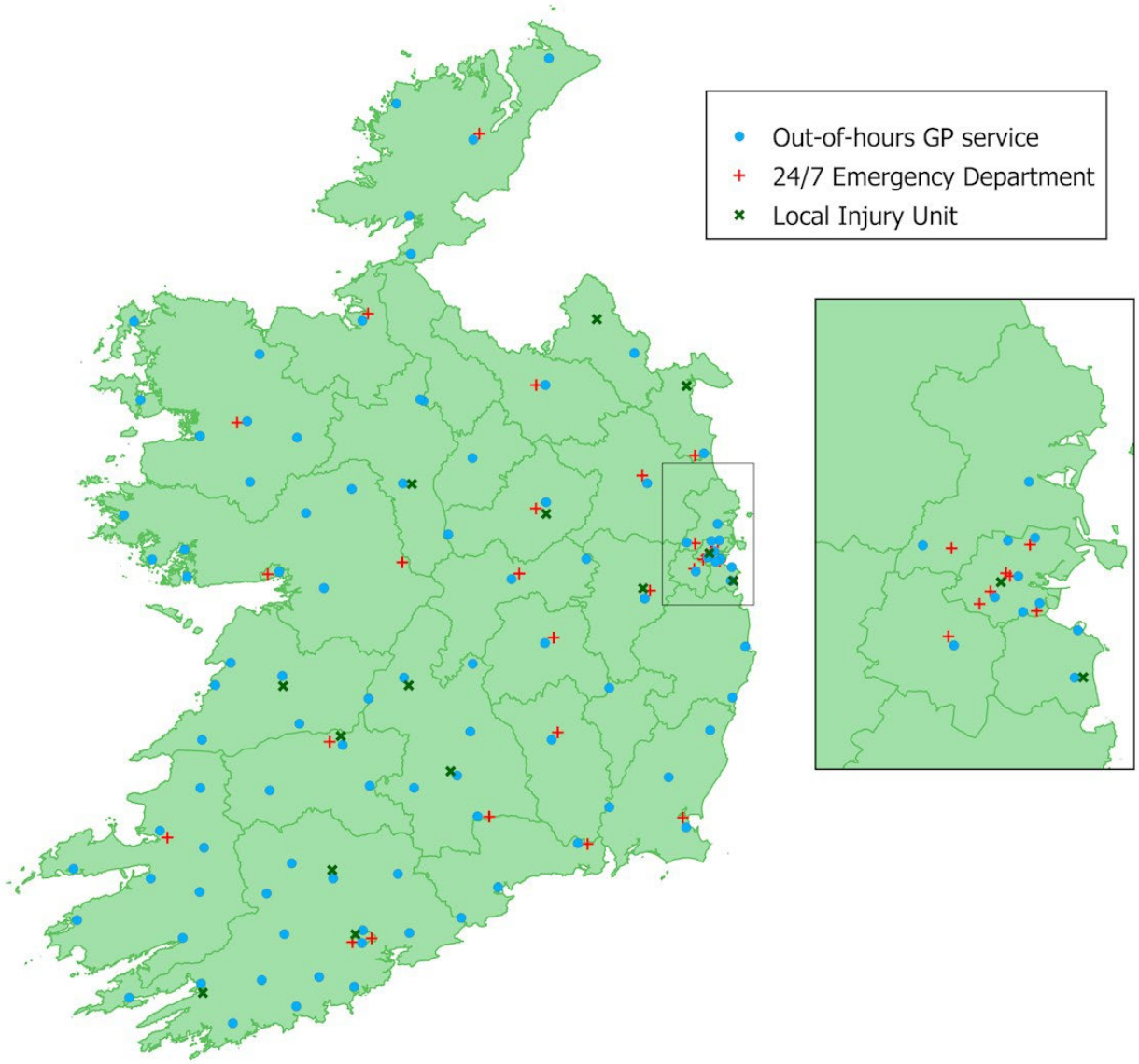
There are 14 injury units throughout Ireland where patients with non-life-threatening or non-limb-threatening injuries can receive care. Injury units do not treat patients aged less than five years of age, although some further restrict care to those aged 16 years and older. Children's Health Ireland (CHI) has an urgent care centre based in Dublin that treats patients aged from three months old to 15 years of age, inclusive.[13] injury units are set up for minor injuries that are unlikely to require admission to hospital such as wounds, bites, minor burns, some broken bones, sprains and strains, among other injuries.[14] Patients can self-refer or be referred by GP or other healthcare professional once they meet the inclusion criteria. In the 2023 Healthy Ireland survey, 4% of those aged 15 years and older reported using an injury unit in a public hospital in the preceding 12 months; this compared with 3% in the 2018 Healthy Ireland survey. The proportion reporting attending an injury unit varied by age and gender, with the highest use reported by those aged 15 to 24 years (7% total; men – 8%, women 6%).[15] There are proposals to increase the number of injury units around the country.[16] Figure 2.2 illustrates the location of the injury units around the country.

2.2.3 Emergency departments

When primary care services and injury units cannot be readily accessed, people with acute, non-urgent medical care needs, who are unwilling or unable to wait, must either self-present to hospital EDs or call the emergency services contact number to be attended by emergency ambulance personnel in order to access healthcare.

There are 29 emergency departments (EDs) on 28 hospital sites in Ireland (Figure 2.2); these operate 24 hours a day, 365 days a year. Some EDs treat adult patients only (16 years and over), while others specialise in paediatric care. The majority of EDs provide services to both adult and paediatric patients on the same site.[17] People can self-present at any ED in Ireland and they may not consistently present at the same ED over the course of a specific health condition or lifetime. This can result in incomplete medical records and duplication of medical records across EDs. Under the current pathway, there may also be people who require care in the ED, but who defer attending as they do not think this level of care is necessary or because they expect long waiting times. In Ireland, there were 1.51 million ED presentations to publicly-funded healthcare facilities in 2022. This represented a 12.6% increase on 2021 and a 14% increase from five years prior in 2017 when there were 1.32 million presentations.[18]

Figure 2.2 Out-of-hours primary care, Injury Units and hospital emergency department locations in Ireland

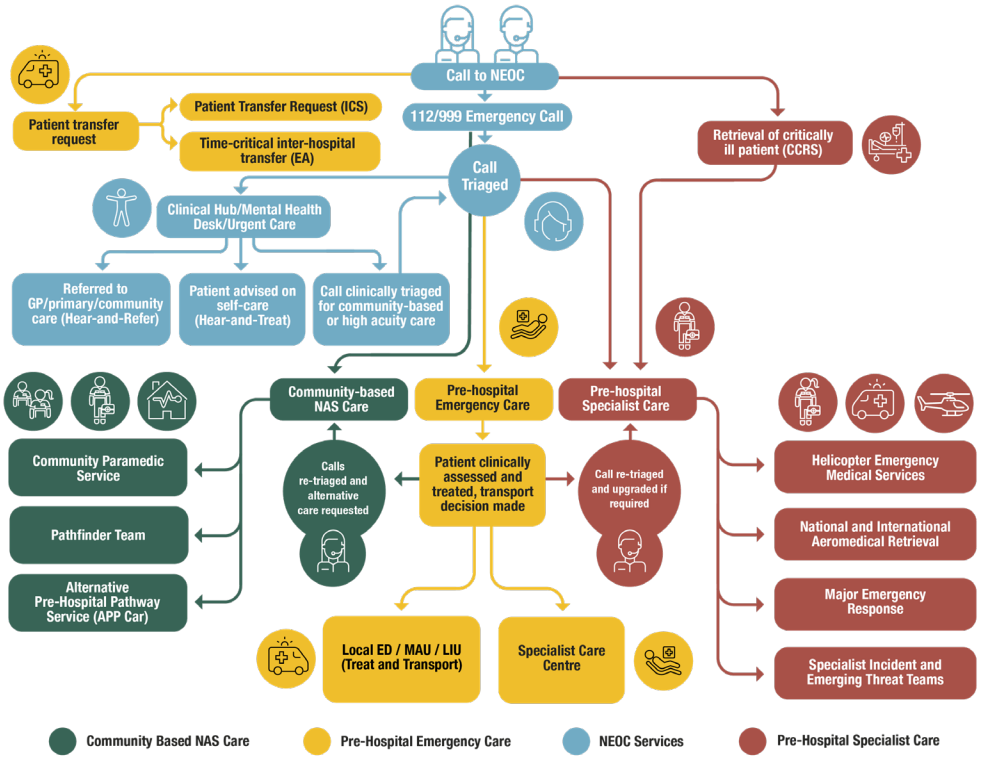


2.2.4 Emergency ambulance services

The Emergency Call Answering Service (ECAS) is responsible for answering all 112 and 999 calls, SMS (texts) and eCalls (automated 112 emergency calling from vehicles) in Ireland. The ECAS identifies the requested service: An Garda Síochána (AGS), Fire, Ambulance, Irish Coast Guard (IRCG) or, in emergencies involving aircraft, the Irish Aviation Authority (IAA). The ECAS also determines the caller's location for the purpose of routing the call to the most appropriate emergency service control centre. The ECAS operators continue to monitor the call until it has been accepted by the relevant emergency service.[19] Figure 2.3 provides an overview of the current pathway options for calls received by the National

Emergency Operations Centre (NEOC). On receipt of an emergency ambulance call from the ECAS operator, calls are prioritised using a software-assisted interrogation process called Advanced Medical Priority Dispatch System (AMPDS). AMPDS provides a unified system to dispatch appropriate aid to medical emergencies, operationalising the Pre-hospital Emergency Care Council (PHECC) emergency medical services (EMS) dispatch standard.[20] The prioritisation process results in one of six determinant codes, each of which has an associated response assignment. These are colour coded and are in descending priority order (Table 2.2).

Figure 2.3 Pathway options for calls received by NEOC in Ireland



Key: GP – general practitioner; IU – injury unit; MAU – medical assessment unit; NEOC – National Emergency Operations Centre.
Source: National Ambulance Service

Table 2.2 Primary response to each of the six determinant levels

Determinant	Definition
Purple	Life threatening – cardiac or respiratory arrest
Red	Life threatening other than cardiac or respiratory arrest
Amber	Serious not life threatening – requiring urgent treatment to relieve symptoms and or time-critical transport
Yellow	Non-serious or non-life-threatening – requiring treatment to relieve symptoms
Green	Non-serious or non-life-threatening – minimal interventions required
Blue	Minor illness or injury

Source: STN001 EMS Priority Dispatch Standard Version 5 PHECC

Caller responses inform the categorisation of incidents. Calls are categorised into one of six categories (Omega, Alpha, Bravo, Charlie, Delta, Echo) determining the urgency of each call, ranging from Omega (the least urgent) to Echo (the most urgent). AMPDS specifies the types of calls that necessitate an EMT, paramedic, or advanced paramedic. Specifically, all Echo calls, along with a subset of Delta and Charlie calls, require an advanced paramedic.

The National Ambulance Service (NAS) is the statutory pre-hospital emergency and intermediate care provider for the State. NAS provides services from 102 locations throughout Ireland, has a fleet of over 500 vehicles, and is supported by over 1,600 staff who ensure operations run 24 hours a day, 365 days a year.[21] In the Dublin area, a region with a population of more than 1.43 million (28.5% of the total population), ambulance services are provided by NAS and the Dublin Fire Brigade (DFB). All firefighters in DFB are trained to paramedic standard and continuously rotate between ambulance and fire duties. DFB's Emergency Ambulance Service contains a fleet of 14 emergency ambulances. Each ambulance is staffed by two firefighter/paramedics or advanced paramedics who are available to respond to emergencies 24 hours a day, 365 days a year. Additionally, there are 21 fire engines with up to 120 paramedics or advanced paramedics available to respond on a daily basis.[22] Emergency aeromedical services are provided by NAS in collaboration with the Irish Air Corps and a commercial provider, with resilience provided by the Irish Coast Guard by agreement with each organisation.

At a local level, NAS is also supported by over 293 Community First Responder schemes and almost 600 NAS off-duty responders, who respond to particular types

of medical emergencies (particularly, cardiac arrest, respiratory arrest, chest pain, choking and stroke) where it is essential for the patient to receive immediate life-saving care while an emergency response vehicle is en route to the patient. Private and not-for-profit providers also play an important role in transporting patients requiring access to healthcare services and in supporting a variety of public and sporting events. NAS also work closely with the Northern Ireland Ambulance Service in the border areas for the benefit of the population on both sides of the border.[23]

NAS operates under the HSE's 'Performance Accountability Framework', which sets out the means by which the service is held to account for their performance in relation to access to services and quality and safety of those services.[24] Demand for emergency ambulances has increased markedly in a five-year period, with NAS responding to 389,764 emergency calls in 2022, a 21% increase from 321,379 calls in 2017, and DFB responding to 148,974 ambulance incidents in 2022, a 30% increase from 114,543 incidents in 2017.[18, 25, 26] This increased demand for emergency ambulance services has similarly been reflected in the international literature.[27-29]

Currently in Ireland, PHECC clinical practice guidelines are primarily built around conveyance to hospital unless the patient declines treatment.[30] In response to the increasing demand for emergency services, NAS has been changing its model of care with a view to ensuring that patients receive the appropriate care in the most appropriate setting. Developments include the introduction of a telemedical clinical hub, a mental health signposting desk, community paramedics, and other hospital avoidance models.[31] The following emergency medical services (EMS) structures and initiatives are provided by NAS and the HSE:

- Emergency Ambulance: Pre-hospital emergency care wherein the patient's condition is assessed, treated and stabilised and the patient is conveyed to the most appropriate care facility.
- Intermediate Care Service: This service provides inter-hospital/inter-facility transfer, often in order to facilitate bed management in acute hospitals.
- Critical Care Retrieval Services: The NAS Critical Care and Retrieval Service (NAS-CCRS) provides a comprehensive inter-hospital retrieval-transfer system for seriously ill infants, children and adults in Ireland. It involves the timely retrieval of patients to an appropriate centre to receive definitive care.
- NAS Aeromedical Service: NAS provides emergency aeromedical services (EAS) on behalf of the HSE, along with transport logistics for paediatric emergency organ transplant recipients requiring transfer to the UK.

- Community First Responder Scheme: Community first responders are groups of volunteers who, within the community in which they live or work, are tasked by NAS to respond to emergencies appropriate to their skill set. Programmes operating throughout Ireland include:
  - Community First Responder Schemes – where community first responders respond to particular types of medical emergencies (most particularly, cardiac arrest, respiratory arrest, chest pain, choking and stroke)
  - Community Rapid Response – where a network of volunteer medical professionals are tasked to deliver more advanced interventions in response to both medical and trauma emergencies.
- See and Treat: This is a process that was developed by NAS during the pandemic. This initiative provides focused clinical assessment by NAS paramedics at the patient's location, followed by appropriate immediate treatment, discharge and or referral. The patient may be referred to other services that are more appropriate to the patient's needs, or which can provide further support to the individual at home or in a community setting, in close liaison with the patient's GP. These initiatives are only available in some locations and do not operate a 24/7 service. See and Treat initiatives that have been implemented include:
  - The Alternative Pre-Hospital Pathway (APP) Team developed in Cork and Limerick, to target low-acuity emergency calls
  - Pathfinder, designed to safely keep older people who phone 112/999 in their own home rather than taking them to a hospital emergency department. The older person is assessed by both an advanced paramedic and occupational therapist/physiotherapist.
- Hear and Treat: This is a service is provided by the medical and nursing staff in NAS's National Emergency Operations Centre (NEOC) Clinical Hub and offers telephone advice to patients who are deemed to have a low-acuity need that does not require transport to hospital. The Clinical Hub is open from 7am to midnight. Typically, there is at least one NAS Specialist Paramedic and one doctor available in the clinical hub from 10am to 10pm on most days. Where telephone advice is not sufficient, patients can be triaged to receive on-scene management or hospital transport.[2]
- Mental Health Signposting service: The HSE mental health signposting service operates from NEOC. This 24/7 service is staffed by specially-trained

emergency call takers. When callers access the service, they receive guidance on where to access mental health services in their local area; however, of note, the current service does not provide clinical advice or support.[32]

2.3 Proposed acute, non-urgent telephone service

The direction of healthcare policy in Ireland is changing. In May 2017, the Sláintecare Report was produced, a cross-political party consensus document on a long-term policy direction for Ireland's healthcare system.[33] The report outlined an integrated model of care which plans that the majority of healthcare will be provided in the community to meet the needs of an older population with its more complex set of clinical and social care needs.[33] Providing definitive care to patients at the first point of contact in the community or referring them to the most appropriate community or specialist service is a key aim of Irish Health Service delivery as described in the Sláintecare report.[33] The need to reduce unnecessary ED attendance in Ireland is also outlined in the Department of Health's Statement of Strategy 2021-2023 — specifically, Strategic Priorities 2 and 3 which are to "expand and integrate care in the community" and "make access to healthcare fairer and faster".[34] Telephone triage plays an important role in managing demand for healthcare, and provision of an acute, non-urgent telephone service is intended to support the provision of timely care in the most appropriate setting.

Telephone health information and advice services began in the 1990s in the United States, Australia and New Zealand. These services offer the public quick and accessible health information and advice, with triage staff including doctors, nurses, and or lay operators, depending on how the service is structured. Operators use computer software to advise callers about the best course of action for the symptoms they describe, and provide advice, ranging from a requirement for ambulance transfer to self-care. Although less common, online tools have also emerged in recent years in the USA, the UK, and other European countries.[35] For example, England has implemented a national service in the form of the NHS 111 (formerly NHS direct) online tool.[36] While the CDSS software used is broadly similar across countries, there are factors unique to each country that mean each telephone service system is designed specifically to reflect the context in which it will operate.

Acute, non-urgent medical care needs can be difficult to distinguish from urgent conditions as there may be overlap in terms of the symptoms experienced. As a result, it is up to the individual or the person making the call to access healthcare to determine the urgency of their particular healthcare need. An acute, non-urgent telephone service in Ireland would operate as a triage system in the pre-hospital setting. The service would involve trained operators taking calls from people who believe they have an acute, non-urgent medical care need. The call operators would

provide telephone triage and redirect callers to an appropriate healthcare setting based on their described symptoms. If a telephone service were to be established in Ireland, the term "acute, non-urgent medical care needs" would need to be defined by the HSE and communicated effectively to members of the public in terms of who should or should not call the service. This issue would need to be considered in both the design and implementation of the telephone service.

The ability of call operators to direct callers to the most appropriate healthcare service to meet their described needs could streamline the experience of people with acute non-urgent healthcare who are uncertain as to who to contact in order to access appropriate care. At a minimum level, the call operator will be able to triage the caller and determine the appropriate healthcare service to refer the caller to, including seamless transfer of the call to the 112/999 emergency service, where clinically indicated. Under an assumption of greater integration of the telephone service with wider healthcare services, call operators could also provide clinical advice and schedule appointments with primary care providers and EDs. However, it is noted that due to an absence of centralised services or integration between services, currently this scheduling of appointments would be difficult in Ireland.

2.4 Telephone service options internationally

The options to access healthcare for acute, non-urgent medical care needs in the pre-hospital setting can vary between countries and regions. Hence it is important to describe practice and systems that are relevant to the Irish context. Telephone advice and or triage healthcare services with varying degrees of health service integration have been implemented in several countries, including the UK, Denmark, Sweden, Australia, Japan and Canada. The aim of this section is to identify telephone service options for acute, non-urgent medical care implemented internationally. The search was limited to the 38 member states of the OECD.[37] In this report the United Kingdom is taken as four separate countries (England, Scotland, Wales and Northern Ireland). Therefore the results presented in this section consider 41 countries. An overview of options available among these 41 OECD countries is provided in Table 2.3.

OOH primary care services are provided in most of the 41 countries considered.[8] Information on OOH primary care services was not found for five countries (Columbia, Costa Rica, Korea, Latvia and Lithuania). Models of OOH service delivery vary greatly across, and often within, these countries, with a mixture of service delivery models being used in most countries (Appendix A Table A1 provides further details of these services). However, irrespective of the service delivery model, EDs still play an important part in non-urgent or out-of-hours care across all OECD countries. A single dominant model of OOH service delivery is seen in 13 countries:

Chile, Denmark, Germany, Hungary, Italy, Luxembourg, the Netherlands, New Zealand, Northern Ireland, Norway, Portugal, Scotland and Wales.[8, 38] Of these, a primary care walk-in model incorporating primary care centres, Injury Units or urgent care centres, is most frequently encountered (n=6), followed by a practice-based GP service model where a GP looks after their own registered patients (n=4), and then large regional general practitioner cooperatives (n=2) and rota-based GP services (n=1) where GPs work in on a rota basis to see their own and other GPs' patients.[8, 38] A mixed model of OOH service delivery is seen in 23 countries: Australia, Austria, Belgium, Canada, the Czech Republic, England, Estonia, Finland, France, Greece, Iceland, Ireland, Israel, Japan, Mexico, Poland, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey and the United States.[8, 38] Where multiple models for delivering OOH services co-exist, EDs either in the traditional sense or as part of an OOH primary care model integrated into hospital EDs, were the dominant model, reported in 17 of 23 countries.[8, 38] Other frequent OOH primary care models seen to co-exist with traditional hospital ED systems included the primary care walk-in model (n=9), followed by the practice-based GP model (n=8), rota model (n=5) and the GP cooperative model (n=5).[8, 38] Australia and England, among others (see Table A1 in Appendix A) use deputising models, whereby GP OOH services are outsourced to commercial entities employing GPs.[8] The Czech Republic, Spain, Switzerland and Turkey are also known to offer different services depending on the location — for example, rural versus urban areas.[8] Finally, in the US, offerings of OOH primary care are largely provider dependent and vary greatly depending on provider plans.[8]

Currently, there are telephone services for acute, non-urgent medical care implemented in 22 OECD countries: Austria, Australia, Belgium, Canada, Denmark, England, Estonia, Finland, Germany, Hungary, Iceland, Italy, Japan, Latvia, New Zealand, Northern Ireland, Norway, Portugal, Scotland, Sweden, Switzerland and Wales.[39-60] The NHS 111 telephone number is used across all four countries in the United Kingdom, although all four services were developed and are run independently, with variation in the service models delivered. The European non-emergency call number, 116117, has also been adopted in four countries (Finland, Germany, Italy and Norway), although each country runs their service independently.

The maturity of telephone services across OECD countries varies. There are a number of mature services, with 13 identified that have been operating for more than 10 years. These included: Healthdirect in Australia, 1733 in Belgium, HealthLink in Canada, the Medical Helpline 1813 in Denmark, NHS 111 in England, the Family Doctor Advice Line in Estonia, 116117 in Germany, 116117 in Italy, 7119 in Japan, Healthline in New Zealand, 116117 in Norway, NHS 24 in Scotland and Swedish

Healthcare Direct in Sweden. NHS 24 in Scotland was launched in 2000, while NHS 111 in England followed its predecessor, NHS Direct, which was set up in 1998. There are also a small number of services in their infancy, with the most recent addition being the PhoneFirst service in Northern Ireland which became operational in 2020.

Among the 22 OECD countries with telephone services, 17 countries have a national or quasi-national system (Australia and Finland have regions not included in the national service delivery). Four countries — Canada, Denmark, Japan and Switzerland — operate a regional service. Of note, multiple provider-specific triage services are available within the United States, but these are dependent on provider coverage. The US services therefore have not been considered here as either a national or regional system.

Of the countries with telephone services, 16 countries operate a 24/7 service. In Belgium the service is offered 24/7 on weekends and public holidays; in Denmark the service is offered after 4pm Monday–Friday and 24/7 on weekends; in Latvia the service is offered from 5pm to 8am Monday–Friday and 24/7 on weekends and public holidays. In contrast to other countries, the phone line in Northern Ireland is available during office hours (8am to 6pm Monday–Friday), except on public holidays. In both Canada and Finland there is regional variation in the operating time of the telephone services.

Most often, in 15 of 22 countries with a telephone service, the operators answering and triaging the calls are members of defined professional groups, such as nurses, paramedics or doctors. In services using clinically-trained call operators, nurses are the dominant profession (n=12), followed by doctors (n=5). Services in England, Italy, Scotland and Wales employ non-clinical, trained call operators to answer and triage calls. Northern Ireland is an outlier in the United Kingdom, as it uses clinically-trained call operators. At the time of its launch, it was highlighted that in order to provide a consistent triage service, there would be a need to leverage existing capacity for clinical assessment provided by OOH GP and the ambulance service.[61] It was not clear from the available literature if operators in Belgium, Germany or Hungary are from clinical or non-clinical backgrounds.

Of the 22 countries with telephone services, 50% also run a linked online or digital service. Online web services exist in 11 countries: Australia, England, Finland, Germany, Hungary, Iceland, Norway, Portugal, Scotland, Sweden, and Wales.[39, 41, 47, 48, 50, 51, 53, 62-65] Some features of the online service include symptom checkers, service finders, medical consultation, appointment booking, access to health records, sickness certification, or prescription renewal. Australia and Portugal also have an associated app for download to mobile devices.[66, 67]

The level of integration of the telephone services with other health services differed across countries. Of the 10 countries who report a level of integration of services, seamless transfer of calls to 999 emergency services is available in Australia, Italy, Japan, New Zealand, England and Wales. In Australia, England, Italy, Scotland and Wales the operator can transfer calls to a health professional for further triage and assessment. In Denmark the call operator is able to provide information on the expected wait time for EDs. In England the operators can arrange appointments with certain health professionals (services not stated) and in Northern Ireland the operator can arrange appointments to attend nurse-led injury services. Finally, in Canada the integration of services differs by region.

Table 2.3 Acute, non-urgent telephone service options OECD countries

Country	Out-of-Hours Primary Care	Telephone service	Established	National / Regional	Triage staff	Operating hours	Online services	Integration of services
Australia[8, 41, 68]	✓	Healthdirect help line (1800 022 222)	2006	National (except Queensland)	Nurses	24/7	Health information, symptom checker, service directory, health records	Able to connect with health services, such as GP, a virtual care pathway or urgent care
Austria[38, 40]	✓	Healthcare help line (1450)	2017	National	Nurses	24/7	NR	NR
Belgium[38, 42]	✓	Telephone Triage System (1733)	2008	National	Trained operators*	Weekends or holidays	NR	NR
Canada[8, 43, 69]	✓	HealthLink (811)	2005	Regional	Nurses	Regional variation in operating time	NR	Linked with health professionals such as nurse practitioners, pharmacists, dieticians, physicians, social workers Mental health and addictions intake and referral services and crisis support Integration of service differs by region
Chile[8]	✓	NR	NA	NA	NA	NA	NA	NA
Colombia	NR	NR	NA	NA	NA	NA	NA	NA
Costa Rica	NR	NR	NA	NA	NA	NA	NA	NA
Czech Republic[8, 38]	✓	NR	NA	NA	NA	NA	NA	NA

Country	Out-of-Hours Primary Care	Telephone service	Established	National / Regional	Triage staff	Operating hours	Online services	Integration of services
Denmark[8, 44, 70]	✓	Medical Helpline (1813)	2014	Regional	Doctors and nurses	After 4pm Monday-Friday and 24/7 on weekends	NR	Linked with ED as the help line provides information on the expected time for examination and treatment
Estonia[8, 46]	✓	Family Doctor Advice line (1220)	2005	National	Doctors and nurses	24/7	NR	NR
Finland[8, 38, 47]	✓	The Medical Helpline (116 117)	2019	National (except Lapland and the Åland Islands)	Healthcare professional	Regional variation in operating time	Service directory	NR
France[8, 71]	✓	NR	NA	NA	NA	NA	NA	NA
Germany[8, 48, 72]	✓	Telephone help line (116 117)	2012	National	Medically trained staff*	24/7	Symptom checker, service directory, appointment booking	NR
Greece[8]	✓	NR	NA	NA	NA	NA	NA	NA
Hungary[8, 38, 51]	✓	Healthline (1812)	2019	National	Contact centre staff*	24/7	Health information, service directory	NR
Iceland[8, 38, 50]	✓	Telephone triage (5131700)	NR	National	Nurses	24/7	Health information, appointment booking, prescription renewal, web chat with health professionals	NR
Ireland[38]	✓	NR	NA	NA	NA	NA	NA	NA
Israel[8, 73]	✓	NR	NA	NA	NA	NA	NA	NA

Country	Out-of-Hours Primary Care	Telephone service	Established	National / Regional	Triage staff	Operating hours	Online services	Integration of services
Italy[8, 49, 74]	✓	Non-urgent medical assistance line (116 117)	2013	National	Non-clinical trained call operator	24/7	NR	Able to connect with GP, primary care, paediatrician Can dispatch ambulance
Japan[8, 52, 75, 76]	✓	Telephone triage service (7119)	2007 (Tokyo) 2009 (Osaka and Nara).	Regional	Nurse	24/7	NR	Can dispatch ambulance
Korea	NR	NR	NA	NA	NA	NA	NA	NA
Latvia[56]	NR	General Practitioners' Advice line (66016001)	NR	National	Doctors	5pm to 8am Monday-Friday and 24/7 during weekends and holidays	NR	NR
Lithuania	NR	NR	NA	NA	NA	NA	NA	NA
Luxembourg[8, 38]	✓	NR	NA	NA	NA	NA	NA	NA
Mexico[8]	✓	NR	NA	NA	NA	NA	NA	NA
The Netherlands[8, 77]	✓	NR	NA	NA	NA	NA	NA	NA
New Zealand[57, 78]	✓	Healthline (0800 611 116)	2005	National	Nurses	24/7	NA	Can connect with ambulance service
Norway[8, 59, 79]	✓	OOH medical services telephone line (116 117)	2010	National	Nurses	24/7	Health information, service directory, health records, prescription renewal	NR

Country	Out-of-Hours Primary Care	Telephone service	Established	National / Regional	Triage staff	Operating hours	Online services	Integration of services
Poland[38]	✓	NR	NA	NA	NA	NA	NA	NA
Portugal[53, 80]	✓	SNS 24 (0808242424)	2017	National	Doctors and nurses	24/7	Health information, symptom checker, health records, prescription renewal, teleconsultation	NR
Slovak Republic[8, 38]	✓	NR	NA	NA	NA	NA	NA	NA
Slovenia[8, 38]	✓	NR	NA	NA	NA	NA	NA	NA
Spain[8, 38]	✓	NR	NA	NA	NA	NA	NA	NA
Sweden[8, 55, 81]	✓	SHD (1177)	2003	National	Nurses	24/7	Health information, appointment management, health records, prescription renewal	NR
Switzerland[8, 60, 82]	✓	Telephone Triage Service (0848 133 133)	2018	Regional	Nurses	24/7	NR	NR
Turkey[8]	✓	NR	NA	NA	NA	NA	NA	NA
United Kingdom – England[8, 45, 83]	✓	NHS 111 (111)	2010	National	Non-clinical trained call operator	24/7	Aged 5 years and above only: Health information, symptom checker, triage advice	Can arrange appointments with healthcare professionals Can dispatch ambulance
United Kingdom – Scotland[54, 84]	✓	NHS 24 (111)	2000	National	Non-clinical trained call operator	24/7	Health information, symptom checker, service directory	Can be connected with a healthcare professional such as a nurse practitioner, dental nurse, pharmacy advisor,

Country	Out-of-Hours Primary Care	Telephone service	Established	National / Regional	Triage staff	Operating hours	Online services	Integration of services
								psychological wellbeing practitioner, mental health nurse
United Kingdom – Wales[39, 85]	✓	NHS 111 (111)	2016	National	Non-clinical trained call operator	24/7	Health information, symptom checker, service directory	Can dispatch ambulance
United Kingdom – Northern Ireland[58, 86]	✓	HSC PhoneFirst (111)	2020	National	Healthcare professional	8am-6pm Monday-Friday except on public holidays	NR	Can arrange appointment to attend nurse led minor injury services
United States[8, 87]	✓	Provider led only	NA	NA	NA	NA	NA	NA

Key: ED – emergency department; GP – General Practitioner; HSC – Health and Social Care; NA – not applicable; NHS – National Health Service; NR – not reported; OECD - Organisation for Economic Co-operation and Development; OOH – out of hours; SHD – Swedish Healthcare Direct; SNS – Serviço Nacional de Saúde.

*Unclear if operators have clinical or non-clinical training.

2.5 Discussion

Acute, non-urgent care needs in a pre-hospital context are those that do not require immediate emergency intervention and could be managed either at a later time or in a non-emergency settings like primary care or community healthcare services. For individuals seeking healthcare, it may be difficult for them to distinguish between medical care needs that require urgent medical attention, and those that are acute, but non-urgent. Currently in Ireland, people have a range of options to access publicly-funded healthcare, including: through their (GP) during office hours or ringing GP OOH services, self-presenting at an injury unit, self-presenting at an ED, or ringing 112/999 emergency ambulance services. People also have the option to visit a community pharmacy where they can obtain advice, receive treatment for a minor illness, or be redirected to other primary care or urgent care services.

In Ireland, when primary care services and injury units cannot be readily accessed, people with acute, non-urgent medical care needs who wish to access healthcare, but who are unwilling or unable to wait, must either self-present to hospital EDs or call the emergency services contact number to be managed by emergency ambulance personnel in order to access healthcare. This results in the presentation of people with non-urgent healthcare needs to hospital EDs. The combination of hospital conveyance and self-presentations to EDs has contributed to an increased burden on emergency services and on EDs. The reasons for this are only partly understood, but comprise a complex mix of changing demographic, health and social factors. Under the current pathway, there may also be people who require urgent care, but who defer attending the ED as they do not think this level of care is necessary or because they expect long waiting times.

An acute, non-urgent telephone service in Ireland would operate as a triage system in the pre-hospital setting. The service would involve trained operators taking calls from people who believe they have an acute, non-urgent medical care need. The call operators would provide telephone triage and redirect callers to an appropriate healthcare service based on their described symptoms. If a telephone service were to be established in Ireland, the term "acute, non-urgent medical care needs" may be challenging to describe and for members of the public to interpret. It can be anticipated that some people will perceive themselves as having an acute, non-urgent medical need when a clinician may not categorise the need as such. The difficulties of distinguishing acute, non-urgent medical care needs, and how this should be incorporated into the design of a telephone service in Ireland, will be addressed in more detail in Chapter 5.

Telephone services for acute, non-urgent care needs are an increasingly prevalent feature of health care delivery internationally; however, the options available vary

among countries and regions. At present, a telephone service for acute, non-urgent medical care has been implemented in 22 OECD countries. The earliest of these services were established in England in 1998 and in Scotland in 2000. At the time of writing, the most recent service to be established is the PhoneFirst service which was set up in Northern Ireland in 2020. A telephone service for acute, non-urgent medical care needs in the pre-hospital setting has the potential to optimise resources, minimise unnecessary visits to EDs and ensure individuals receive timely and appropriate care. There are many factors, unique to each country, interacting with each other which can impact on how a telephone service is designed and implemented. These will be discussed in more detail in Chapter 3.

3 International scoping review of the use and impact of acute, non-urgent telephone services

Key points

- A scoping review was undertaken to assess the evidence for the impact on health outcomes and healthcare delivery for identified telephone services (distinct from the 112/999 emergency service) for acute, non-urgent medical care needs in the pre-hospital setting.
- Seventy-one primary research studies were included. Studies were identified from 11 countries (Belgium, Denmark, Finland, Sweden, England, Scotland, Switzerland, Australia, Canada (Alberta), Japan and New Zealand).
- The countries differed in terms of the existing healthcare system in which the acute, non-urgent telephone service was implemented as well as the maturity of the telephone service. Moreover, there were differences in the level of analysis conducted on the telephone service.
- The rationale for implementing an acute, non-urgent telephone service was broadly similar across countries. The main objective is to reduce emergency department (ED) attendance, and to improve access to timely assistance and appropriate care.
- Studies from five countries reported the impact on ED attendances. Two countries reported a positive effect (avoidance of unnecessary resource use, decreased demand), while three countries reported either no effect or conflicting findings. As such, the international evidence did not clearly demonstrate whether a telephone service leads to reductions in ED presentations. Moreover, there was conflicting evidence of the impact of a telephone service on ambulance and primary care utilisation.
- Considering the caller demographics of acute, non-urgent telephone services internationally:
  - The largest user subgroup of callers was those aged 20–65 years followed by people aged 0–20 years and finally those aged 65 years and older. In the paediatric population, calls were most frequently in relation to one- to four-year-olds.

  - Callers reported a consistently high level of satisfaction. Satisfaction was affected by call waiting times, communication style and clarity, caller expectations, and agreement with the advice received.

- Considering the effectiveness of acute, non-urgent telephone services internationally:
  - All countries noted a steady increase in calls to the service over time. However, service targets for answering calls within timeframes and minimising abandoned calls were consistently missed.
  - Callers to the telephone services were typically advised to visit their GP (9% to 69%), attend the ED (5% to 49%), or were given self-care advice (7% to 51%).
  - Reasons for service use included the convenience and accessibility of telephone triage and advice without appointment. Barriers to its use included having readily accessible GP or ED services in the area, difficulty in communicating an illness over the phone, and a lack of knowledge and awareness of how to access the service.
  - In addition to their impact on EDs, introducing an acute, non-urgent telephone services may affect other health system stakeholders including primary care, GP out-of-hours services, and ambulance services. Unless a call is closed with self-care advice, the outcome of a call may be a shift in resource use among different healthcare settings.
- Considering the impact of acute, non-urgent telephone services on appropriateness, safety and compliance:
  - The proportion of calls that were considered to have been under-triaged (that is, received advice or referral to a lower level of care than was needed) ranged from 0.8% to 18%. The proportion of calls that were considered to have been over-triaged (that is, received advice or referral to a higher level of care than was needed) ranged from 5% to 22%.
  - Across countries, studies reported high levels of compliance to triage advice. The factors affecting compliance were the time of the call, socioeconomic status of the caller, and the advice given.
- Considering the impact of acute, non-urgent telephone services on costs and resource saving:

  - Complexities in estimating costs include a lack of robust data about resource use, set-up and ongoing running costs of the service, software costs, and measurable health outcomes.
  - There is a difficulty in calculating initial set-up costs where existing infrastructures are used, limiting comparisons that might be made with brand new services.

- The evidence suggests that there are many factors, unique to each country, interacting with each other, which can impact on the performance of an acute, non-urgent telephone service. Given the array of between-country and between-study differences, it was not possible to draw conclusions on patterns across countries and studies.
- While international experience suggests that telephone services for acute, non-urgent care are becoming increasingly common, the evidence base for their effectiveness remains limited and mixed. Our scoping review highlighted a lack of robust, synthesised evidence regarding the impact of such services on health system performance, resource use, and patient outcomes.

3.1 Introduction

The available options to access healthcare for acute, non-urgent cases in the pre-hospital setting can vary among countries and regions. The aim of this chapter was to assess the impact of a telephone service for acute, non-urgent medical care implemented internationally, considering specifically practices and systems that are relevant to the Irish context.

3.2 Methods

3.2.1 Research question

The following research question was formulated to reflect the outcomes associated with operating an acute, non-urgent telephone service:

- What is the evidence for the impact on health outcomes and healthcare delivery for any identified operating telephone services (distinct from the 112/999 emergency service) for acute, non-urgent medical care needs in the pre-hospital setting?

The PICOS (population, area of interest, context, outcomes of interest, study design) framework used to formulate the international scoping review is presented in Table 3.1.

Due to the exploratory and broad nature of the review question, a traditional systematic review methodology was not appropriate and therefore this question followed a scoping review methodology. A scoping review can be defined as a form of evidence synthesis that addresses an exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined field by systematically searching, selecting, and synthesising existing evidence.[88-90] The review adheres to the Arksey and O'Malley six-stage framework.[91] This scoping review framework follows the main systematic reviewing principles. However, it allows for more flexibility in terms of inclusion and exclusion criteria, pays less attention to quality appraisal and is more focused on presenting a thematic overview of findings rather than determining any definitive effect estimate.

Table 3.1. PICOS for scoping review of international practice

Population	People who have an acute, non-urgent medical care need in the pre-hospital setting.
Interest	A telephone service, distinct from 112/999, to access the healthcare system for acute, non-urgent medical care needs in the pre-hospital setting.
Context	OECD countries
Outcome	The main outcomes of interest are: ▪ appropriateness (medical appropriateness and or accuracy of advice or referrals) ▪ compliance (user compliance with advice given) ▪ costs (costs or cost savings — for example, costs saved from callers' change in subsequent health-care-seeking behaviour as a result of the call) ▪ disposition (triage outcome) ▪ safety (the safety of triage decisions made — for example, the rate of potential adverse events or triage errors) ▪ service impacts (impacts on telephone triage service or other services, either from increased or reduced service use and or increased or reduced staff workload) ▪ service use (performance analysis) ▪ user characteristics ▪ user experience (for example, satisfaction, reassurance, doubts about competency, relevance of triage questions).
Study design	Empirical evidence (all study designs) from the following document types: ▪ reports

	▪ evaluations ▪ HTAs ▪ peer-reviewed publications.

Key: HTA – health technology assessment; OECD – Organization for Economic Co-operation and Development.

3.2.2 Search strategy and information sources

A comprehensive electronic search was performed in Medline Complete and Embase (via Ovid). Grey literature sources were also searched with a particular emphasis on the following websites for Organization for Economic Co-operation and Development (OECD) countries: professional bodies, departments of health, ambulance service websites, and HTA agencies. Additionally, the first 100 results of Google were searched. The search strings, developed in consultation with an information specialist, are provided in Table A2 in Appendix A. Additional search methods used included forward citation searching of eligible studies and searching reference lists of identified systematic reviews and included studies. Only empirical evidence (all study designs) was included. Searches were limited to the period from 2004 to January 2024 to capture the most recent 20 years of data. A cut-off of 2004 was chosen on the basis of an initial scoping exercise which showed that the majority of acute, non-urgent telephone services across OECD countries were established in the last 20 years.

3.2.3 Study selection and data extraction

Titles and abstracts of retrieved articles were screened independently by two reviewers. The full text of potentially eligible articles was retrieved and independently assessed for eligibility by two reviewers according to the pre-specified inclusion and exclusion criteria outlined in Table 3.2. Data extraction was conducted independently by two reviewers using a standardised, pre-piloted electronic data extraction form. Any disagreements were resolved through discussion, and with third party arbitration, when required. As this is a scoping review aiming to provide an overview of a diverse range of outcomes and practice, no formal quality appraisal was undertaken.

Table 3.2. Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
▪ Information is provided on outcome data regarding the implementation of a telephone service, distinct from 112/999, for acute, non-urgent medical care needs in a pre-hospital setting.	▪ Studies that describe an acute, non-urgent telephone service without providing any quantitative or qualitative outcome data. ▪ The telephone service is specific to a patient group with an existing

▪ The telephone service has been implemented at a national or regional level. ▪ The implemented telephone service is generally applicable to all members of the public regardless of age and or existing condition.	healthcare condition. ▪ The telephone service is specific to a specific cohort of the community (for example, paediatric population). ▪ A service designed to include those with acute and urgent conditions. ▪ The telephone service is specific to an individual hospital/specialist centre/care provider. ▪ Studies focused on the broader structures of acute, non-urgent medical care pathways and supports without reference to a telephone service. ▪ Conceptual papers and projections of possible future developments.

3.2.4 Data synthesis and analysis

This scoping review is reported in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist.[89]

3.2.5 Country profiles

Following identification of OECD countries for which published outcome data were available in the scoping review, consideration was given to the volume of empirical evidence and the relevance of each country's healthcare system to the Irish context. Country profiles were developed to describe the health system and model of service for acute, non-urgent telephone services identified. Data to inform these profiles was obtained from grey literature sources with a particular emphasis on the following websites: professional bodies, departments of health, ambulance services, and HTA agencies.

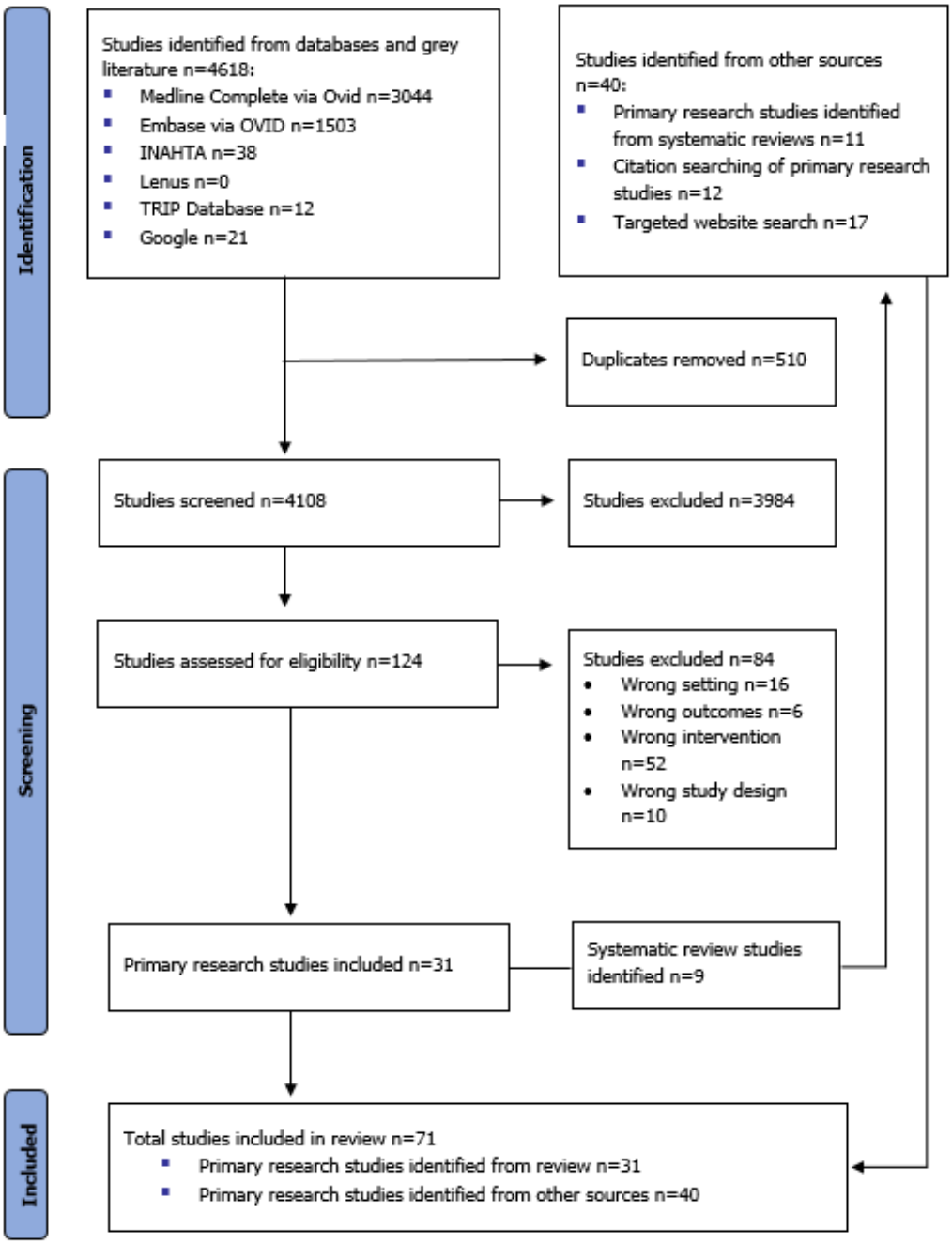
While this assessment refers to the proposed Irish telephone line as "an acute, non-urgent telephone service", international models vary in their purpose, scope, and integration with local health systems. For example, NHS 111 in England is formally categorised under urgent care services, yet it remains distinct from emergency services such as 112/999. To maintain clarity and consistency when comparing international evidence, the term "acute, non-urgent telephone services" is used throughout this assessment as a collective descriptor. This term reflects the shared function of these services: delivering medical advice and triage for health concerns that are acute but do not require an immediate emergency response.

We acknowledge that each country included in this international review may operate multiple helplines and advisory services that provide telephone-based health information. However, it was beyond the scope of this review to identify or assess how such services are integrated with, or operate alongside, the national acute, non-urgent telephone services. As such, our analysis focused primarily on the main acute, non-urgent telephone service in each jurisdiction only.

3.3 Results

After removal of duplicates, 4,108 title and abstracts were assessed for eligibility. A total of 124 studies required full-text review with 31 primary research studies fulfilling the inclusion criteria. A total of 40 primary research studies fulfilling the inclusion criteria were identified from other sources, resulting in a total of 71 studies. An overview of the study selection process is presented in Figure 3.1.

Figure 3.1 PRISMA flow diagram of study selection process



3.3.1 Characteristics of included studies

Seventy-one primary research studies were identified. Table 3.3 provides a summary of the number of studies identified for each country. An overview of the characteristics of the included studies is provided in Table A3 in Appendix A.

Eighteen studies were conducted in England, 13 in Sweden, 12 in Denmark, nine in Australia and seven in Scotland, four in Japan, two in Canada (Alberta), two in Belgium and two in New Zealand. One study was identified for each of Finland and Switzerland. The included studies were published between 2004 and 2023.

Table 3.3. Included studies

Country/ Region	Telephone service	Total studies	Study design	Number of studies
Belgium	1733	2	Observational	1[92]
			Cross-sectional	1[93]
Denmark	1813	12	Prospective	4[94-97]
			Cross-sectional	3[98-100]
			Mixed methods	2[101, 102]
			Secondary data analysis	2[103, 104]
			Descriptive and comparative	1[44]
Finland	116 117	1	Prospective	1[105]
Sweden	SHD	13	Cross-sectional	3[106-108]
			Retrospective	3[109-111]
			Population-based survey	2 [112, 113]
			Qualitative	2[114, 115]
			Observational	1[116]
			Descriptive and comparative	1 [117]
			Mixed methods	1 [118]
Switzerland	CTMG	1	Cross-sectional	1[119]
England	NHS 111	18	Mixed methods	4[45, 120-122]
			Observational	2[123, 124]
			Data linkage study	2[125, 126]
			Statistical report	2[127, 128]
			Controlled before and after study	2[129, 130]
			Population-based survey	2[129, 131]
			Summary analysis of reports	1[132]
			Qualitative	1[133]
			Quantitative	1[134]
			Secondary data analysis	1[135]
Scotland	NHS 24	7	Report	2[136, 137]
			Retrospective	2[138, 139]

			Cross-sectional	1[140]
			Qualitative	1[141]
			Mixed methods	1[54]
Australia	Healthdirect / Nurse-On-Call	9	Observational	3[142-144]
			Data linkage	2[145, 146]
			Financial report	1[147]
			Adapted case-control	1[148]
			Cross-sectional	1[149]
			Audit report	1[150]
Canada	Healthlink	2	Environmental scan	1[43]
			Data linkage	1[151]
Japan	7119	4	Observational	3[52, 152, 153]
			Pre- and post-interventional	1[76]
New Zealand	Healthline	2	Primary data analysis	1[154]
			Retrospective audit	1[155]

Key: SHD – Swedish Healthcare Direct; CTMG – Telephone Center for Doctors on Call; NHS – National Health Service.

3.4 Results: country profiles

This section provides an overview of acute, non-urgent telephone services for pre-hospital healthcare internationally, looking at the high-level context within which this service is provided, the model of service, and governance of the service. As outlined in Table 3.3, OECD countries for which studies were identified for inclusion were:

EU	*Rest of Europe*	*Rest of world*
▪ Belgium	▪ England	▪ Australia
▪ Denmark	▪ Scotland	▪ Canada
▪ Finland	▪ Switzerland	▪ Japan
▪ Sweden		▪ New Zealand

Considering the countries that have implemented an acute, non-urgent telephone service to meet the needs of the general population in the pre-hospital setting, the stated rationale for implementing the service was broadly similar across countries. That is, the main objective is to reduce emergency department (ED) attendance, and to provide care to people at the right place and the right time. However, differences were seen in terms of the existing healthcare system in which the acute, non-urgent telephone service was implemented, the maturity of the telephone service, and the level of analysis conducted on the telephone service.

A full review of the health system and model of service was conducted for the following countries: Denmark, Sweden, England, Scotland and Australia. These countries were chosen based on the results of the scoping review which identified a large volume of empirical evidence for these five countries. A smaller volume of empirical evidence was identified for Belgium, Finland, Switzerland, Canada, Japan and New Zealand. As such, a shorter overview of the acute, non-urgent telephone services available in these countries is provided. As the empirical evidence identified for Canada was focused on the region of Alberta, the overview for Canada focuses on this region specifically.

3.4.1 Belgium

Organisation of the Belgian healthcare system is divided between the federal authorities and the federated entities. In total, 99% of Belgian residents are covered by compulsory health insurance, either through a chosen sickness fund or a public auxiliary fund.[156] Over three quarters of health expenditure was publicly-funded through taxation in 2021, with out-of-pocket payments and voluntary health insurance making up 17.9% and 4.5% of funding, respectively.[156]

The telephone service in Belgium (1733), established in 2008, is intended for non-urgent medical services on weekends or holidays. In some areas, this number can

also link with local on-call medical services. In these areas of Belgium, the 1733 service works in synergy with emergency 112 calls. Calls to 1733 are answered by trained operators, but these individuals may not necessarily have medical experience. Operators use the Belgian Medical Regulation Manual to direct callers to the appropriate care level.[42]

3.4.2 Denmark

The health system in Denmark is organised into three administrative levels: state, region and municipal. The state holds the overall regulatory, supervisory and fiscal functions. The country is divided into five regions. Each region has responsibility for hospitals, specialties and primary healthcare within their own area. There are 98 municipalities with responsibilities for community services such as nursing homes, public health and rehabilitation services. The relationship between the state, region and municipal levels is not hierarchical, but collaborative.[157] Denmark has a well-developed health information system including unique personal identification numbers which allow linkage of health data from all areas of the health sector.[157] Primary care services are delivered by self-employed general practitioners (GPs), who operate according to a national agreement about tariffs, and regional plans that specify capacity and focus areas. GPs are the first point of contact for patients and have a key gatekeeping role to more specialised services.[157]

3.4.2.1 Model of service

Out-of-hours (OOH) care is delivered differently across all five Danish regions. Table 3.4 compares the GP cooperative and Medical Helpline 1813 models of telephone triage in OOH primary care for the Central Denmark region and the Capital Region of Denmark.[103] In the Central Denmark Region, OOH primary care is organised by GPs in large-scale cooperatives. GPs perform telephone triage and deal with the presented problem by giving telephone advice or by referring the caller to a subsequent face-to-face consultation.[158] In the Capital Region of Denmark, a medical help line service was established in 2014 to create a single entrance for non-urgent care during on-call hours. Medical Helpline 1813 sought to integrate OOH medical on-call telephone consultation into the new 1813 number. The service operates after 4pm on weekdays and 24/7 at weekends.[159] Nurses perform the triage; they are supported by a computerised decision support system (CDSS) and have the opportunity to consult a doctor (or hand over the call), but these doctors may also directly answer calls.[44]

Nurses have the ability to receive photos or switch to video triage/consultations as required.[44] Operators have the option to finish a call with self-care advice, prescription (doctors only), advice to contact a GP during normal opening hours, organising an on-call doctor home visit, ambulance, referral to emergency clinics or

other services or hospitalisation. Onward referrals from 1813 to emergency clinics may take one of three pathways:

- illness treatment pathway
- injury treatment pathway
- assessment pathway.[44]

Table 3.4. Organisation of telephone triage in out-of-hours primary care

	GP cooperative	Medical Helpline 1813
Region	Central Denmark Region	Capital Region of Denmark
Population*	1.37 million	1.91 million
Organiser	GP cooperatives in the region	Regional administration
Organisation and services	▪ Telephone consultations, home visits and clinic consultations run by the GPC. ▪ GPs are obliged to take part in the service.	▪ Telephone consultations and home visits run by 1813. ▪ Clinic consultations are located in hospital facilities and run by EDs.
Remuneration of professionals	Fee for service	Payment per hour
Triage model	▪ GP or GP trainees in their final year of specialty; no CDSS available. ▪ GPs work 8 hour shifts and are employed for 1 to 4 shifts per month in addition to their daytime job.	▪ Nurses are obliged to use a CDSS and have option to redirect calls to a physician. ▪ Physicians have different medical specialties (a minority being GPs); they do not have to use CDSS. ▪ Nurses work 8-hour shifts and are mostly fully employed at 1813. ▪ Physicians work 8-hour shifts and are employed in addition to their daytime job.

Key: CDSS – computerised decision support system; ED – emergency department; GP – general practitioner, GPC – general practitioner cooperative.
*Population in Q1 2024
Source: Adapted from: Graversen *et al.* (2023)[103]

3.4.2.2 Governance structure

The services offered by Medical Helpline 1813, pre-hospital emergency functions, and 112 AMK-call centre, alongside other administrative functions, come under the Capital Region's Emergency Preparedness Council. In turn, the Capital's Emergency Preparedness Council is governed by the Regional Council and Corporate Management and must adhere to the region's framework for operational targets and budget management.[44] The Emergency Preparedness Council and 1813 directors must present quarterly on operating targets to the Regional Council, the Executive Committee and the Health Committee.[44]

3.4.3 Finland

After a prolonged period of restructuring, Finland's health system reverted to regional delivery of health and social care services via 22 Well-being Service Counties, with financing from state budgets.[160]

Finland's Medical Helpline (116117) was introduced in 2019. The telephone line is available 24/7 for advice and guidance for non-urgent conditions. Healthcare professionals assess the urgency level of the call in line with the regions' guidelines. The service is delivered via the Well-being Service Counties and has evolved to also include digital services which provide health advice and information on regional services, and the ability to book and manage doctor's appointments through a dedicated app.[161]

3.4.4 Sweden

The healthcare system in Sweden is decentralised and organised into three levels: national, regional and municipal.[162] No hierarchical relation exists across the state, county councils and municipalities.[163] The Ministry of Health and Social Affairs is responsible for the overall healthcare policies and national governance.[162, 163] Twenty-one regions and 290 municipalities are responsible for healthcare service delivery in Sweden. Each region develops its own plan, organises healthcare as per the need of the residents and also decides on resource-allocation decisions for healthcare.[162] The Swedish healthcare system is primarily funded through taxation, and services are provided publicly. Along with the public healthcare services, there are also private healthcare services present in Sweden.[164] Around 10% of the total population have private health insurance which covers specialty programmes.[164]

GPs are the first point of contact for patients and they act as gatekeepers for referrals to hospitals or specialists.[163] In an emergency situation, patients can access care through two pathways: patients can call 112 to access the national emergency telephone service, which manages pre-hospital ambulance resources; for acute, non-critical cases, patients are advised to contact the national telephone nursing service, Swedish Healthcare Direct (SHD).[106]

3.4.4.1 Model of service

SHD was implemented across Sweden between 2003 and 2013.[116] The service aims to provide appropriate medical advice to a person presenting with a medical problem and signpost them to a suitable care level.[114] The service is comprises five components to ensure the safety of the calls:

- qualified staff
- medically-approved guidelines

- electronic medical records
- staff training programmes
- standards.[116]

SHD is organised as a network to which all 21 regions are connected. There are 33 call centres across Sweden operating 24 hours a day, seven days a week.[114] Nurses use a symptom-based CDSS to triage a caller to one of the following measures:

- self-care advice
- appointment with a GP
- visit to the ED.[55]

3.4.4.2 Governance structure

The SHD is regulated in the same way as other forms of Swedish healthcare. The Ministry of Health and Social Affairs is responsible for the overall healthcare policies and national governance while each region is responsible for the operation of SHD at a municipal and regional level.

3.4.5 England

Since 2013, operational oversight for the National Health Service (NHS) has sat with NHS England. Integrated care systems, which replaced Clinical Commissioning Groups (GCGs) in July 2022, are responsible for planning health and care services at the local level. The 42 integrated care systems in England represent collaborative local partnerships, uniting health and care entities to develop cohesive strategies and integrated services.[165] Comprising NHS organisations and upper-tier local councils within their respective regions, these systems also incorporate voluntary organisations, social care providers, and other stakeholders contributing to enhancing local health and wellbeing.

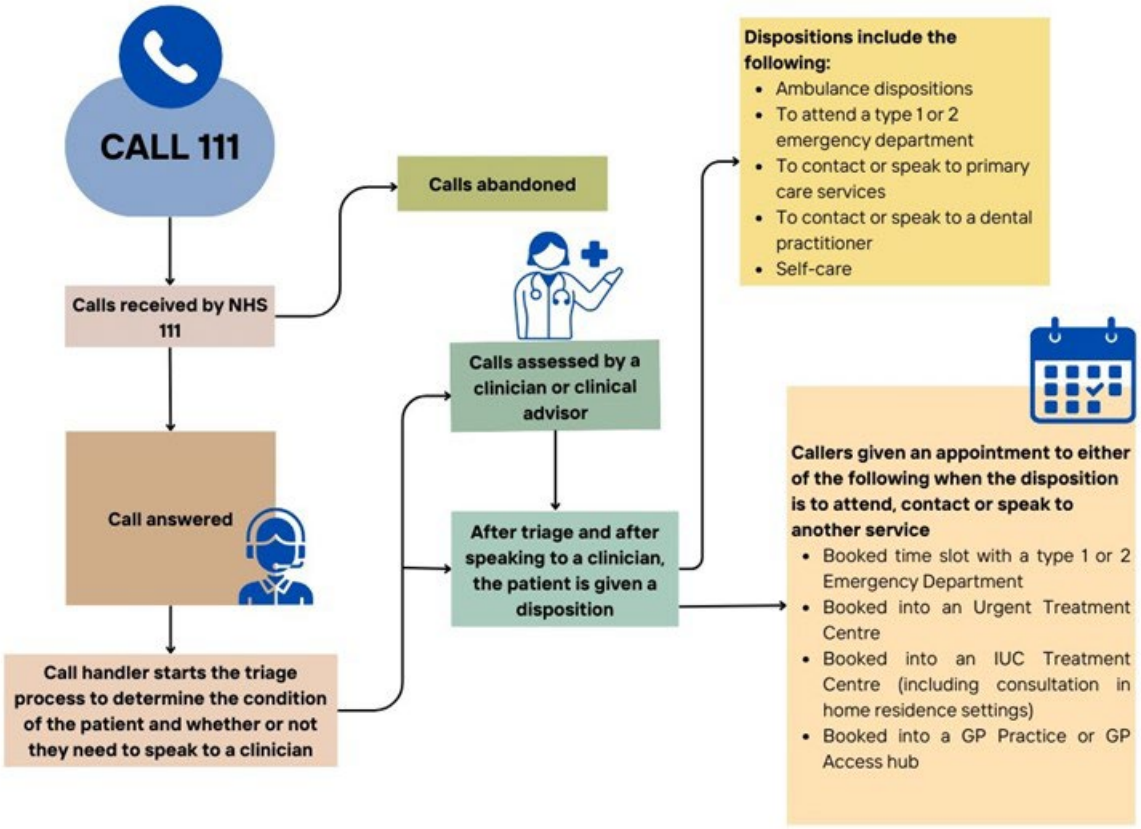
In England, the urgent care system comprises various components to cater to different levels of urgency and medical needs. Primary care services, primarily provided by GPs, act as the first point of contact for individuals seeking medical assistance for minor illnesses and injuries. Available OOH care options ensure access to medical assistance beyond regular clinic hours, with services such as OOH GP services, walk-in centres, and urgent care centres catering to the needs of patients during evenings, weekends, and public holidays. This structured approach to urgent care delivery aims to optimise resources, minimise unnecessary visits to EDs, and ensure individuals receive timely assistance and appropriate care.[166]

3.4.5.1 Model of service

NHS 111, a telephone service to address all requests for urgent assistance, was developed as a solution to challenges encountered by individuals seeking non-emergency care. England had a pre-existing, nationally-available, nurse-led, 24-hour telephone help line called NHS Direct which also provided OOH call handling for some general practices. Established in 2010, NHS 111 was set up as a free-to-use help line for non-emergency matters, operating 24 hours a day, seven days a week. Its purpose is to provide advice and to signpost people to the right level of service, whether a GP, a Walk-in Urgent Care Centre or an ED. It was designed to streamline access to healthcare services, alleviate pressure on EDs, and ensure individuals receive appropriate care tailored to their needs.[45] The expected benefits of NHS 111 were increased satisfaction with urgent care and reduced unnecessary calls to the 999 emergency ambulance service, thereby addressing concerns regarding the inappropriate use of emergency services.[130] The NHS 111 implementation phase was complex due to the concurrent decommissioning of its predecessor, NHS Direct, which ceased service in 2014.

Figure 3.2 shows the process flow of NHS 111 calls. The telephone service is administered by call handlers, the majority of whom are not clinically trained; where appropriate, the call can be passed on for further assessment by a clinician, typically a nurse. Operators use a CDSS to triage and assess callers. Operators then determine the urgency of each situation, offer advice, arrange appointments with healthcare professionals, or dispatch an ambulance when necessary. While NHS 111 call handlers can make appointments for callers in OOH primary care, individuals may also access OOH primary care through some GPs directly or by attending walk-in primary care and urgent care centres.[167, 168]

Figure 3.2 NHS 111 and Integrated Urgent Care 2021/2022



Source: Adapted from NHS 111[169]

3.4.5.2 Governance structure

At a national level, NHS England is responsible for overseeing the implementation and operation of the NHS 111 service. Clinical oversight is typically provided by clinical directors or clinical leads who are responsible for ensuring that clinical protocols and guidelines are followed, and that healthcare professionals delivering the service are appropriately trained and supervised. Since July 2022, the commission of NHS 111 services is the responsibility of the integrated care systems that work in partnership with NHS England. Commissioners are responsible for procuring services from providers, setting service specifications, and monitoring performance against agreed targets and standards. Contracts between commissioners and providers outline the service requirements, performance indicators, and financial arrangements.[170]

Provider organisations are responsible for managing day-to-day operations, staffing, technology infrastructure, and service delivery in line with contractual obligations and national standards. Regulatory bodies such as the Care Quality Commission and

NHS England's Regional Teams are responsible for monitoring and inspecting NHS 111 services to ensure compliance with regulatory standards and requirements.[171] Some NHS 111 services may have clinical advisory groups or committees comprising healthcare professionals from various specialties. These groups provide clinical oversight, guidance, and support to ensure that the service maintains high standards of clinical care and decision-making.

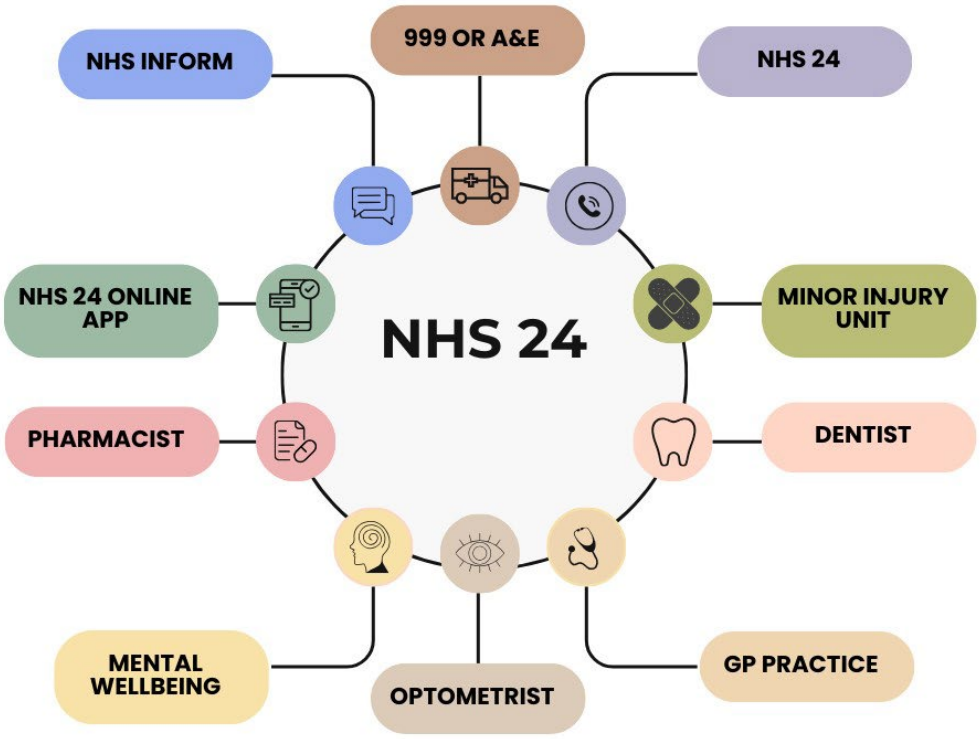
3.4.6 Scotland

Scotland's NHS forms part of the wider UK NHS, though it has devolved responsibility through the Scottish government to provide mostly direct publicly-funded secondary care services. Primary care services are free at the point of care for patients registered with a Scottish or UK general practice; GPs, dentists and pharmacists operate as independent contractors. NHS Scotland operates across 14 regional NHS boards with responsibility for delivering frontline healthcare services and improving population health. Regional NHS boards work alongside partnership organisations including local authorities and the voluntary sector. This occurs alongside Public Health Scotland and seven special NHS boards (Healthcare Improvement Scotland, NHS Education for Scotland, NHS National Waiting Times Centre, NHS 24, Scottish Ambulance Service, The State Hospitals Board for Scotland, NHS National Services Scotland) who support regional boards and supply a range of specialist and national services.[172] NHS boards report to Scottish Government Ministers, with support from the Scottish Government Health and Social Care Directorates.[173]

3.4.6.1 Model of service

Figure 3.3 demonstrates the services available for acute/urgent care in Scotland. OOH primary care calls, non-urgent care requests, advice about self-care, health information and onward referral to a range of integrated services are dealt with through the nurse-led 111 number of NHS 24, a telephone and digital service which integrates with GP cooperatives, EDs and the Scottish ambulance service.[54] Although similar to NHS 111 in England, NHS 24 in Scotland has evolved separately.[54] NHS 24 was launched in 2002 with an aim to provide a high quality, 24/7 available healthcare service, accessible through a single national telephone number, directing callers to the right service according to their need.[54] NHS 24 can refer callers to OOH primary care services. Alongside the 111 telephone service, NHS 24 also provides a number of other services which utilise a combination of telephone or digital platforms including webchat and health information websites.[174]

Figure 3.3 NHS 24 Right Care, Right Place



Source: Adapted from NHS 24[175]

3.4.6.2 Governance structure

The NHS 24 board is ultimately responsible for setting the strategic direction and ensuring efficient resource use. There are five committees who report to the NHS 24 board:

- the Audit and Risk Committee
- the Clinical Governance Committee
- the Planning and Performance committee
- the Remuneration Committee
- the Staff Governance Committee.[176, 177]

3.4.7 Switzerland

Switzerland has a highly decentralised administrative and political structure, organised into three levels of government: the Confederation, 26 cantons and 2,352 municipalities. The healthcare system is funded through enrolee premiums, taxes, social insurance contributions, and out-of-pocket payments. Residents are required

to have mandatory health insurance and have the option of supplementary coverage in the form of voluntary health insurance.[82]

For non-critical care, individuals in the canton of Vaud (western Switzerland) can call 0848133133 for telephone triage services. The service is provided by the Centrale Téléphonique des Médecins de Garde (CTMG), which translates to 'on-call doctors' telephone centre'. It was introduced in 2018 to ensure easier access to the services of doctors and dentists and to avoid patients presenting to the ED when they cannot reach their usual practitioner.[60] The CTMG operates 24 hours a day, seven days a week. It is staffed by trained nurses who direct the individual to the most appropriate medical solution.[119, 178]

3.4.8 Australia

Australia's health system is primarily funded by Australian state and territory governments as well as non-government funders such as private health insurers and individuals. State and territory governments fund and manage public hospitals, regulate and license private hospitals and other health premises. They also deliver community-based and preventive services and ambulance services.[179] Services accessed through the private system are funded by a combination of government and private entities including private health insurance. As of 2023, approximately 55% of the total population has some form of private health insurance.[180]

3.4.8.1 Model of service

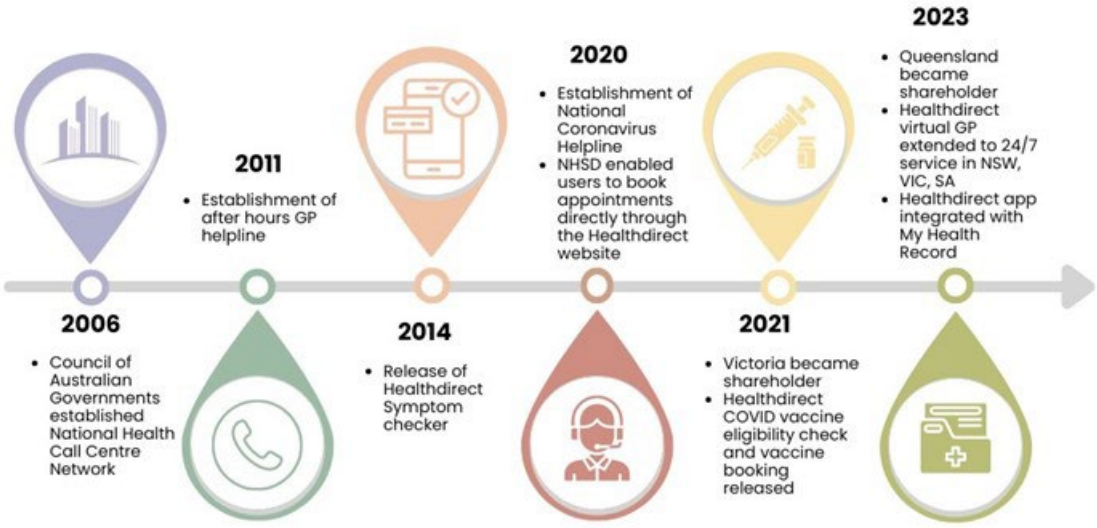
The Healthdirect Australia help line (called Nurse-On-Call in Victoria, and 13Health in Queensland) was established in 2006[143] as part of a suite of services to address the need for a centralised, national health phone line service to improve clinical consistency, economic efficiency and reduce administrative duplication (Figure 3.4).[181]

The service is operated 24 hours a day, seven days a week by registered nurses who do not have access to the medical history of the callers. Callers are triaged using a CDSS. The nurse advises one of the following dispositions (triage outcome) to callers:

- direct transfer to ambulance services
- attend ED immediately
- see a doctor either immediately or within specific time frame (4h, 24h, 72h or 2 weeks)
- self-care advice or health information only
- see a dentist or other health provider within a specific time frame.[142, 143]

The triage nurse can also transfer the caller to the after-hours GP help line for further assessment.[143] The after-hours GP help line was established in July 2011 to support Healthdirect Australia. Healthdirect services have also evolved to include online channels through which people can access health information online, find health services and receive advice to check their symptoms.[182]

Figure 3.4 The evolution of Australia's Healthdirect service



Source: Adapted from Healthdirect Australia[183]

3.4.8.2 Governance structure

Healthdirect Australia services are delivered by a sub-contracted provider. The information and advice provided are in line with Healthdirect Australia's clinical governance and quality framework, Australian health guidelines and best practice health literacy principles. There is a governance team which oversees the feedback complaints and incident process and clinical governance is also managed by the Board's Clinical Advisory Committee.[182]

3.4.9 Canada

Canada has a decentralised, universal, publicly-funded health system called Canadian Medicare. Healthcare is primarily funded and administered by the 13 provinces in the country. The healthcare system is primarily funded through taxation.[69] Citizens and permanent residents in Canada can access medical and physician services free of charge at the point of use. About two thirds of Canadians also have private health insurance.

HealthLink is a telephone triage service operating in the province of Alberta. The service, established in 2005, provides free advice and general health information 24 hours a day, seven days a week.[184] The operators for this service are primarily registered nurses. Other professionals such as information and referral specialists, licensed practical nurses, mental health therapists, occupational therapists, physiotherapists, social workers, psychologists, physicians, and tobacco counsellors also play a role in the telephone triage service. The callers can also be referred to other health professionals such as dieticians, physicians, and social workers. There is also an interpreter/translation service available and an indigenous support line to ensure callers receive culturally appropriate advice.[43, 184]

3.4.10 Japan

Japan is divided into 47 prefectures which rank immediately below the national government and form the country's first level of jurisdiction and administrative division.[185] Japan's health system is based on a statutory health insurance system with tax subsidies and some co-payments. All residents of Japan are required to enrol into the health insurance programme.[185]

In Japan, patients directly access primary and secondary healthcare services through small clinics or treatment centres, or through the outpatient departments of larger hospitals.[185] For acute, non-urgent medical care needs, telephone consultation services are available in Tokyo, Osaka and Nara prefectures, which in total have a combined population of 24.1 million.[186] These services were established between 2007 and 2012. Callers are connected to Emergency Medical Services (EMS) consultation operators if looking for hospitals, and EMS consultation nurses or doctors if in need of EMS consultation. The service is jointly operated by the local governments, medical association and firefighting authorities.[52, 76, 152]

3.4.11 New Zealand

New Zealand's health system is primarily funded through general taxation. A government-set budget and benefits package is regionally administered through 20 district health boards.

Healthline is the telephone triage service offered in New Zealand. It was set up in 2000 to improve access to health advice and services especially for population groups with difficulty in accessing healthcare. It provides free call health advice, information and treatment from professional healthcare providers 24 hours a day, seven days a week. Staff are from a variety of professional backgrounds including nurses, paramedics, health advisors and doctors.[57, 78]

3.5 Results: Key outcomes

Due to the exploratory and broad nature of the review question, a number of key outcomes were identified and used to structure the results of this scoping review. These outcomes were:

- caller demographics: to include caller characteristics, caller experience
- effectiveness: to include service use, key performance indicators (KPIs) and service targets, service impacts
- appropriateness, safety and compliance
- costs.

Table 3.5 provides an overview of the number of studies reporting on each outcome for each country considered. Additional details with respect to the study outcomes are provided in Table A4 in Appendix A. Sections 3.5.1 to 3.5.4 provide summary results for each outcome category. In providing these summaries, it is noted that results cannot be directly compared and interpreted due to variations among the countries and the regions.

Table 3.5. Key outcomes assessed in included studies

Country	Service use & goals	Caller characteristics	Caller experience	Compliance	Service impacts	Appropriateness & Safety	Costs
Belgium						2	
Denmark	4	7	9		1	4	1
Finland		1				1	
Sweden	2	4	6	1	6	2	1
Switzerland		1	1	1	1		
England	10	5	3	8	8	2	3
Scotland	6	4	3	2	1	1	2
Australia	2	7	4	5	1	4	2
Canada		1		1			1
Japan	1	3		1	2	1	1
New Zealand				1		1	
Total studies	**25**	**33**	**26**	**20**	**20**	**18**	**11**

3.5.1 Caller demographics

3.5.1.1 Caller characteristics

Thirty-three studies from ten countries (Denmark, Finland, Sweden, Switzerland, England, Scotland, Australia, Canada, Japan and New Zealand) described the characteristics of users of the acute, non-urgent telephone services.[187] Table A5 in Appendix A provides further detail on user characteristics.

Sample size ranged from eight participants to 1.9 million participants, reflecting a variety of study designs and purposes.[54, 114, 120] In some cases (for example, for children, persons with intellectual disabilities), the call could be made by a parent, guardian, or carer. Irrespective of whether the call is made by the individual or the carer, the term 'caller' will be used to describe the person with the medical issue. From 28 studies,[45, 52, 54, 76, 94, 96-99, 104-107, 114, 119-122, 131, 138, 140, 143-146, 148, 151, 152] where the gender of the caller was identified, on average, 55% of callers were female.[76, 114, 121]

Seventeen studies provided a breakdown of caller age by age group.[45, 54, 98, 99, 119-122, 131, 138, 140, 143, 145, 146, 148, 149, 151] In fifteen of these studies, on average, 35% of the sample size were aged 20 years or younger.[45, 54, 98, 99, 119-122, 138, 140, 145, 146, 148, 149, 151] Three studies focused exclusively on the paediatric population, with all three reporting that the largest subgroup in this population was those aged between one and four years, inclusive (65.4% to 87.6%).[117, 121, 149] Seven studies provided data on the general population aged 0 up to 65 years and older.[54, 98, 99, 120, 122, 145, 151] Overall, the largest subgroup was aged 20 to 65 years (50%) followed by those aged 0 to 20 years (35%) and those aged 65 years and older (15%).[54, 98, 99, 120, 122, 145, 151] Five studies provided data exclusively on adults aged 16 years and older.[45, 119, 131, 140, 143] In each of these studies, those aged 20 to 65 years were more frequent users of acute, non-urgent telephone services compared with those aged 65 years and older (on average, 70% vs. 30%).[45, 119, 131, 140, 143] As subgroups were based on age alone, it should be noted that the health needs will be diverse for such broad groupings.

The person who made the call was frequently either calling for themselves (31.4% to 82.8%) or they were a parent of a child who required care (19% to 45%).[54, 76, 100, 140, 142, 143] Two studies specifically focusing on children reported that calls or questionnaires were mostly filled by mothers (73% to 77%) compared with fathers (20% to 27%).[117, 121] A study from Sweden reported that mothers called five times more often than fathers for their children.[107]

The original intention of the caller and the reasons for calling a telephone triage service were considered in two studies, with the studies reporting that 28% and 35% of callers, respectively, called the telephone service as they did not know what to do.[142, 143] The next most frequent original intentions reported were 'intended to contact the GP or HCP' (24% to 25%) followed by 'intended to call an ambulance or attend the ED' (18% to 19%).[142, 143]

Nine studies reported on socio-demographic indicators such as household income, socio-economic status, and education of the caller. [96, 97, 104, 107, 119, 138, 140, 142, 149]Seven studies reported on the household income or socio-economic status of the caller (see Table A6 in Appendix A).[96, 97, 104, 138, 140, 142, 149] The proportion of callers belonging to the lowest socio-economic status, having lower income or having highest deprivation ranged from 15% to 32%. In contrast, 11% to 57% of callers belonged to the highest socio-economic status, highest income or lowest deprivation category.[96, 97, 104, 138, 140, 142, 149] Five studies also reported on the educational status of the caller. The proportion of callers having a higher degree of education ranged from 27% to 70%.[96, 104, 107, 119, 140]

Across the included studies, the most commonly reported reasons for contacting the telephone services were illness not otherwise specified (19% to 66%), injury (11% to 34%), conditions related to the limb and extremities (10% to 22%), gastrointestinal conditions (16% to 19%), abdominal pain (12% to 19%), chest pain (15%), skin, wound and rashes (6% to 12%), fever (12%), vomiting/coughing/hiccups/bringing up blood (5%) and regarding new symptoms (69%) (Table A7 in Appendix A).[94, 104, 105, 117, 120, 139, 140, 143-145, 148, 149, 151]

3.5.1.2 Caller experience

Caller experience was explored in 30 studies, covering a range of topics including caller satisfaction, caller experience of access and waiting times, caller perception of the service, communication and advice.[44, 45, 54, 76, 94-96, 98-102, 108, 109, 112-115, 118, 119, 121, 122, 131, 135, 137, 140, 147-150] Of note, aspects of caller experience are subjective and results presented were often not assessed using validated scales, therefore caution is necessary when interpreting these results.

Consistently high levels of caller satisfaction with acute, non-urgent telephone services have been reported in studies from Denmark, Switzerland, England, Scotland and Australia. In Denmark, 2017 data relating to daily user surveys of the 1813 service reported over 90% of callers were generally satisfied and that satisfaction levels were upheld in periods of increased demand when waiting times were longer.[44] Overall, 88 to 90% of survey respondents who called 1813 in

Denmark in a three-week period reported having a good or very good overall impression of the service, with no difference noted by time of call, day of the week, who was calling or disposition (triage outcome).[102] Satisfaction rates were higher for calls in relation to non-acute compared with acute conditions.[102] Users of Healthdirect in Australia also reported high levels of satisfaction, with 89% of the general population reported as being satisfied. Satisfaction was also high among callers where English was not their first language or where callers identified as First Nations.[147] These figures were mirrored in regional data from Victoria where the overall satisfaction levels of callers to the Nurse-On-Call service was consistently above 98% between 2007 and 2010.[150] In England, there was no reported difference in overall satisfaction for users of urgent care in the pilot site areas pre- and post-implementation of NHS 111.[45] During the pilot phase of NHS 111 in 2010/11, 73% of callers reported being very satisfied with the process (95% CI: 71% to 75%) while 19% reported being fairly satisfied and 5% were dissatisfied.[45] Callers who were auto-routed to NHS 111 from another service were less satisfied than those who direct-dialled NHS 111.[45] Overall satisfaction with NHS 111 calls in England between April 2014 and March 2016 remained high, with 87% reporting being either fairly or very satisfied. However, the percentage of callers who reported being very satisfied with the service decreased from 73% in the pilot phase, to 68% between 2014 and 2016. Early survey reports of user views of NHS 24 in Scotland compared with the service that was in place prior to its implementation were mixed, with reports of NHS 24 being better for 17% to 92% of respondents, compared to worse for 10% to 56%, depending on location.[54] Satisfaction with the service in 2013 was high, with over 80% of callers stating they were either satisfied or very satisfied.[140] In 2022/23, the percentage of total complaints to NHS 24 that were considered stage 2 complaints — that is, where a complainant is not satisfied with early resolution attempts and request a more detailed investigation — was considered very low at 0.001% of total complaints.[137] Callers to a telephone triage service in Vaud, Switzerland also scored highly for overall satisfaction with a mean score of 8.56 out of 10 (standard deviation (SD) 1.8).[119]

Three studies linked caller satisfaction to expectations.[54, 108, 118] In Scotland, persons with an expectation of a home visit, an in-person appointment, or who were unsure of what to expect, were less likely to be very satisfied with NHS 24.[54] A Swedish study also demonstrated that satisfaction with 1177 was linked to a caller's expectation and agreement with advice received. Callers who disagreed with a lower level of healthcare advice than they initially expected were significantly less satisfied than those who were in agreement and or received an expected or higher level of healthcare advice.[108] Similarly, an earlier 1177 survey reported that 94% of callers

who agreed with the advice given were satisfied compared with 33% of callers who disagreed with the advice given.[118]

Callers' experience of access and waiting times was considered in four studies.[54, 100, 102, 150] A report from the Nurse-On-Call service in Victoria reported that callers from non-English-language backgrounds, and hearing and speech impaired callers, were significantly under-represented among service users. Out of a total of 338,824 calls in a one-year period, fewer than 100 calls required an interpreter, with only 38 calls to the national teletype service for hearing- or speech-impaired callers.[150] Overall, callers in Scotland reported ease of access with contacting NHS 24, with over 85% reporting it quite or very easy to access, although there were some regional differences.[54] User surveys in 2015 from Denmark's 1813 service reported 43% of respondents felt the waiting time was too long, up from 20% in 2014, whereas 52% felt it was adequate, down from 62% in 2014.[100, 102] Callers outside of weekday hours (Monday to Friday, 8am to 4pm) were more likely to report that the waiting time was too long.[100] Waiting time was related to callers' overall impressions of 1813, with few callers, who felt the waiting time was too long, rating both overall impression of the contact and overall impression of the advice given as good or very good.[100, 102] Interviews with callers also identified cases where waiting times in 1813 resulted in callers hanging up and driving to an ED.[102] In Scotland, time spent waiting on hold or waiting for a call back impacted upon callers' satisfaction compared with being put through straight away, with an 18 to 23% difference in those reporting being very satisfied with the service.[54]

The importance of good communication between callers and operators was explored in 12 studies.[54, 98-102, 109, 114, 115, 119, 121, 148] Studies from Denmark reported that nurse triage was linked to a significantly lower relative risk of poor quality general communication and health-related communication than GP triage or hospital doctor triage.[98, 99] Callers assessed the overall perceived quality of communication and the overall perceived safety during telephone triage similarly for both nurses and GPs.[98, 99] However, callers assessed overall perceived efficiency and quality of telephone triage as significantly lower for both nurses and hospital doctors compared with GP triage.[98, 99] Of note, in Denmark, GPs coordinate OOH care outside of the Capital Region while nurses and doctors, specialising in or with experience in general medicine, are employed at 1813 in the Capital Region.

An Australian audit of Healthdirect in 2021 concluded that key features of communication that represent client-centeredness such as active listening, appropriate language and clear advice were present always or usually in over 90% of calls, with these data representing an improvement on previous audits.[148] Poor communication was identified in a study from Denmark as a potential factor

contributing to under-triage. The authors advised a collaborative caller and call operator systemic approach to problem identification.[101] The caller's experience of communication with 1813 staff was further explored in user surveys in 2014 and 2015. Communication between staff members was examined, with the proportion of respondents reporting poor use of information already relayed to triage nurses by subsequent doctors increasing from 29% in 2014 to 37% in 2015.[100, 102] Over 90% of callers felt heard and understood by staff.[100, 102] A number of papers from a large study in Denmark identified a trend between a caller's degree of worry (DOW) and acute hospitalisation, whereby callers with maximum DOW were three times more likely to be admitted to hospital than those with minimum DOW.[94, 95] Furthermore, socio-demographic factors such as low socio-economic status and non-Western ethnicity were highly associated with high DOW.[96]

Studies from Switzerland showed that users of a telephone triage service in Vaud felt they had been listened to, with a score of 8.77 out of 10 (SD 1.7), and that staff were professional (8.85, SD 1.7).[119] In Sweden, qualitative interviews with eight callers were thematically analysed into three themes of feeling trapped, feeling disrespected and feeling invited. Authors found being invited to participate and feeling listened to had a positive effect on caller wellbeing, trust and further healthcare service use, solidifying the importance of mutual agreement and concordance in telephone triage.[114] Another small sample of interviews with Sweden's 1177 callers reported that friendly, supportive, respectful and composed dialogue with the caller playing an active part of the process was key to perceived good advice, and increased compliance and acceptance.[115] A review of incident reports at Sweden's 1177 during 2007 (n=452) identified 6% of incidents (n=28) were related to information and communication, of which over 3% (n=15) were related to unpleasant encounters between triage nurses and callers.[109] In Scotland, the introduction of NHS 24 did not have an effect on the degree to which callers felt listened to compared with ringing a GP cooperative, but callers were more likely to report being given time to speak when using NHS 24.[54] However, surveys after the introduction of NHS 24 also noted that fewer callers felt that the advice given was tailored to their needs, and a smaller proportion felt that the telephone contact had given them a better understanding of their problem and therefore improved coping ability.[54] Where parents or carers were calling NHS 111 in England for children under the age of 16 (n=996), 93% (n=923) felt that the operator listened to them carefully.[121]

The caller's perception of the advice they received was considered in nine studies.[45, 54, 100, 102, 113, 115, 121, 122, 149] A survey of callers to 1813 in Denmark reported that 86% found the advice received to be useful or very useful. There was no difference if the

advice received was from a nurse or doctor.[100, 102] A small sample of callers to the 1177 service in Sweden over a single day in 2005 reported that they received up-to-date and relevant information from their call, which encouraged use of the service.[115] Among parents or carers calling the NHS 111 in England (n=986) in 2015, 78% (n=772) had confidence and trust in the first person they spoke to about their child.[121] Similarly, trust and confidence in the advice from the 1177 service in Sweden was good, with 63% of survey respondents reporting that they felt confident; however, confidence levels were lower in respondents who rated their health condition as fair (59%) or poor/very poor (52%).[113] Notably, trust in the 1177 telephone service was highest in those aged 70 years and older, while trust in 1177 online was highest in those aged 18 to 36 years.[113] In Australia, 85% (n=196) of parents or carers attending an ED in Melbourne who called Nurse-On-Call beforehand for children (n=230) found the call helpful. However 22% (n=51) of those who attended an ED after Nurse-On-Call did so because they were still worried; the triage advice for these individuals was not reported.[149] In a survey of users during the pilot phases of England's NHS 111 (n=1,695), 65% of respondents reported receiving very helpful advice (n= 1108, 95% CI: 63% to 68%), while 28% (n=468) reported receiving quite helpful advice.[45] Similar findings were reported for the 2019/20 period, with 90% of users (n=263) reporting that the advice received was quite or very helpful. Differences were noted between NHS 111 telephone users and NHS 111 online users; even with adjustment for age, gender, ethnicity and long-term conditions, NHS 111 telephone users were significantly more likely to report that the advice received was very helpful when compared with NHS 111 online users.[122]

3.5.2 Effectiveness

3.5.2.1 Service use and service goals

A total of 24 studies were identified that explored the performance of acute, non-urgent telephone services in three countries: Denmark, England and Scotland.[44, 45, 54, 98, 102, 103, 112, 115, 121, 129-137, 139-141, 149, 150, 188] Performance was primarily explored through the volume of calls to the service; how members of the public perceived and used the service; the time of day calls were made; and if the telephone service was the caller's first point of contact with the health system.[44, 45, 54, 98, 102, 103, 112, 115, 121, 129-131, 134, 136, 137, 139-141, 149, 188] Performance was also analysed against set targets and standards in relation to the call answering time, the number of calls abandoned and the volume of call backs that were required.[44, 45, 54, 130, 132-136, 150] Table A8, Table A9, Table A10, and Table A11 in Appendix A provide an overview of the key findings from these studies. Of note, caution is advised in comparing service use and service goals across countries. This is as a result of differences in the acute, non-urgent

telephone services being delivered, differences in the wider health system in which the service is operating, and the different service goals being set. Where possible, trends across studies and countries have been highlighted.

Service use

3.5.2.2 Volume of calls

The total number of calls made to NHS 111 across England has increased over time from just over 15 million in 2016[189] to over 22 million calls in 2023.[190] In Scotland, there was also a steady increase in the number of calls to NHS 24 between 2002 and 2005 as the service was rolled out. However, this increased demand does not appear to be solely as a result of additional centres coming online.[54] During 2011, a total of 1,285,038 calls were made to NHS 24, rising to 2,119,887 calls in 2022/23.[136, 137, 139] Clear reasons for increasing use of services were not given; however, in Scotland, rising demand for OOH primary care was noted prior to the introduction of NHS 24.[54] While disaggregated call volumes for the telephone services were not identified for Denmark, studies show that the number of telephone consultations to emergency medical services per 1,000 citizens decreased from 2009 to 2016 and was found to remain largely unchanged after the transition to the medical line 1813 in 2014.[44, 98, 103]

3.5.2.3 The caller's first point of contact with the health system

A number of studies explored how the true impact of telephone triage services may only be realised if callers are using them as their first point of contact.[45, 112, 115, 121] In a survey of 652 callers to the four pilot sites of NHS 111, the percentage of callers contacting NHS 111 as a first service was between 2% and 11%. However, due to differing levels of awareness of the pilot service, these could be seen as a minimum level rather than actual usage.[45] In a review of calls to North West London NHS 111 for children under the age of 16 years between 2013 and 2015, NHS 111 calls were rarely preceded with a visit to the ED or OOH services.[121] This is consistent with the NHS 111 being the first point in the care pathway. A key principle of England's NHS 111 service is to provide the "right care, first time" with either resolution of calls through NHS 111 or by a single referral to the appropriate care provider who can resolve the problem.[45] As a proxy measure of directing people to the "right care, first time", the length of contact pathway associated with NHS 111 as the first contact was used in a 2012 report on the pilot phase of NHS 111.[45] The report showed that NHS 111 was the sole contact for approximately 48% (n=832) of survey respondents (n=1,721). Of those with another contact (n=827), 58% (n=479) reported being in contact with only one other health service in the five days

after their NHS 111 call, most commonly primary care. Considering that NHS 111 is an extra service within the pathway, the authors hypothesised positive effects would only be seen in long pathways. However, comparing pathway lengths (for example, the number of steps taken for resolution of the healthcare issue) pre- and post-implementation of NHS 111, there was no overall evidence of the length of the contact pathway decreasing with the introduction of NHS 111.[45]

3.5.2.4 How the service is perceived and used by members of the public

Twelve studies assessed how the service was perceived and used by members of the public.[45, 54, 102, 112, 115, 121, 131, 139-141, 149, 188] These are summarised below. The finding that call volumes were considerably higher outside of normal office hours was consistent across studies from England and Scotland, with figures ranging from 82% to 90% of calls being made in the OOH period.[54, 121, 139] In an analysis of calls relating to children under 16 years of age with one of four common conditions (fever, diarrhoea and vomiting, breathlessness and constipation), the results show that for each of the four conditions, there was at least a 1.5-fold increase in daily call volume on Saturdays and Sundays compared with weekdays.[121]

Studies from three countries (Sweden, England, Scotland) reported reasons for use and non-use of a telephone service; an overview of some of these is provided in Table A10 in Appendix A. A study from England, focused on whether NHS 111 was being used appropriately by callers, found that people broadly understood under what circumstances to use NHS 111.[131] In Scotland, criticism of the national NHS 24 model came from people in rural or remote communities. These people were accustomed to local service delivery and many felt the national model did not consider the differences in healthcare delivery required for such locations, including the lack of access to healthcare services such as emergency or primary care centres.[141] Other suggestions for improving NHS 24 included quicker response times, having more medically-trained people answering the phone, less repetition, and making people more aware of how and when to use the service.[140]

Awareness or knowledge of acute, non-urgent telephone services may affect user uptake. A survey of people self-referring to EDs in the Capital Region of Denmark reported that lack of knowledge of the 1813 service and its functions had a large part to do with their non-use of this service.[102] After receiving education, most reported that in the future they intended to call 1813. A survey (n=40,744) in Sweden in 2012 reported between 52% and 72% of persons over 18 years of age were aware they could call 1177 for advice and help with healthcare. Awareness was lowest among older age groups.[112] In the year after the introduction of NHS 111 in four pilot sites in England, overall awareness of NHS 111 was 59% (n=4,687 of

8,010 survey respondents).[45, 188] Meanwhile in a survey of 1,495 people, 86% were clear on when it was appropriate to call NHS 111.[131] Having a service which is reliable and available 24 hours a day was deemed as a source of security by 1177 callers in Sweden.[115] Of people surveyed in 2012 who had called 1177 in the previous six months (n=6,518), 76% (n=4,954) found that it was easy or very easy to get through to 1177.[112]

Service goals and quality development

Ten studies assessed how service goals were set and how quality development was monitored.[44, 45, 54, 130, 132-136, 150] Table A11 in Appendix A provides details of service goals and quality development as reported.

In Denmark, as part of quality development initiatives, comprehensive and ongoing training is provided for both doctors and nurses. Caller satisfaction surveys are carried out daily among users of 1813, and both internal and external audits are carried out on caller processes.[44] Call answering targets for the 1813 service are set politically in the Capital Region and reported against daily. These include a target for 90% of calls to be answered within three minutes and for 100% of calls to be answered within 10 minutes. In 2016, the Capital Region reported that only 45% and 75% of calls met these targets, respectively. Although performance improved in 2017, the targets were still not met.[44]

In England, a range of process evaluation methods for the NHS 111 service is used. These include the collection of routine data to analyse service use, caller satisfaction surveys, and qualitative interviews with key stakeholders.[45] Calls to NHS 111 in England are expected to comply with National Quality Requirements (NQR) for OOH call handling.[191] These requirements state that 95% of all calls must be answered within 60 seconds. Most calls to NHS 111 are answered within 60 seconds, however the 95% target has rarely been met. The percentage of calls answered within 60 seconds has also fallen over time, from 92% in 2014 to 59% in 2023.[132, 134, 135] Abandoned calls are those in which the caller hangs up at least 30 seconds after they have been queued to speak to an advisor. Abandoned calls represent an unquantifiable clinical need, as the caller's condition has not been established.[134] The NQR for abandoned calls set a target of no more than 5% of calls abandoned.[191] In the first year of operation, all four pilot sites met this target.[45, 130] However, this target has rarely been met since.[134, 135] For example, the average proportion of calls abandoned every month between August 2022 and January 2023 has been 18%.[134] In addition to these two quality requirements, the NHS 111 service design specifies that NHS 111 should be delivered without call backs except in very exceptional circumstances, that is, if a call needs transferring to a clinical

advisor this should be done at the time of the call. If no advisor is available, the caller can be offered a call back and the call then queued and a call back made within 10 minutes.[45] In the first year of NHS 111, all pilot sites provided call backs, representing between 1% and 3% of calls, although the percentage of call backs decreased over the first year of operation.[45] One UK study reported that the misalignment between the information provided by the caller and the ability of the call handler to capture that information, as a result of the call protocol, could lead to issues on proper transfer of care advice.[133] Another study reviewed 54 cases to check if four key processes had been achieved: clear identification of the reason for the call, early recognition of a serious/emergency situation, obtaining adequate history, and performing adequate assessment. The results show that in 14.8% of the calls (n=8), the call management process had not been achieved.[45]

In Scotland, a key performance indicator framework was developed with the Scottish Government to reflect the changes to NHS 24 since its implementation, and to demonstrate the value that NHS 24 adds across the whole health and care system, while considering the experiences and perspectives of service users and what matters most to them.[136] This framework included metrics for call answering times (for example, for 50% of calls to be answered within five minutes). However, in 2022/23, only 25% of calls to NHS 24 were answered within five minutes.[136] Figures also show that the level of call backs increased from 2% in 2003 to 34% in 2005, but more up-to-date data could not be sourced.[54, 136]

The Nurse-On-Call contract in Victoria sets a target of 80% of calls to be answered within 20 seconds. However, between 2006 and 2010, this target was repeatedly missed. Data shows even small increases in seasonal demand resulted in missed targets. While the average waiting time was 33 seconds in 2009/10, during the H1N1 influenza event in June 2009, only 21% of calls were answered within 20 seconds.[150] Contract negotiations in 2009 doubled fines for recurrent breaches of targets and resulted in more consistent target achievements.[150]

3.5.2.5 Service impacts

As described in the previous section, the majority of telephone dispositions (triage outcome) in England, Scotland and Australia were to primary care services, including OOH primary care. In Sweden, the majority of callers received self-care advice, and in Denmark a large number of callers were advised to attend the ED. The impact of these dispositions on the wider health system is discussed in this section. Due to differences in models of service delivery and metrics reported, results across countries, studies and specific services are not comparable. However,

Table 3.6 provides a high-level impression of the impact on specific services across countries based on the key findings discussed below.

The overall impact of introducing an acute, non-urgent telephone service on other services in the health system was explored in 16 studies from seven countries.[44, 45, 52, 54, 106, 110, 116, 123, 125-128, 132, 150, 152] In Australia, a study reported that the Nurse-On-Call service successfully reduced demand on staff time in EDs.[150] This was achieved by ED staff transferring callers to the Nurse-On-Call service.[150] This amounted to 1,761 prevented ambulance call-outs and 15,752 prevented ED presentations in a 12-month period from 2008 to 2009, two years after the service was introduced.[150] In Denmark, the number of people presenting to EDs remained stable after the establishment of the 1813 phone service. However, the number of on-call doctor visits fell by 71% with the introduction of 1813, from 45 visits per 1,000 citizens in 2013 to 13 visits per 1,000 citizens in 2014. Further, the introduction of strict criteria for referral to on-call doctor visits through 1813 resulted in the number of referrals to on-call doctor visits decreasing by 84% between 2014 and 2016 to seven visits per 1,000 citizens.[44] A study from Sweden reported no statistically significant changes in overall levels or trends of healthcare visits after the introduction of the 1177 phone service.[116] However, subgroup analyses one year after the introduction of 1177 demonstrated a 12% increase in the rate of primary care visits and an 11% decrease in the rate of secondary care visits.[116] A snapshot of adult attendances at EDs in Sweden over a 24-hour period in 2018 reported that 11% of attendances (n=409 of 3,875) were referred from 1177.[106] This compares with a report of regional attendances at one hospital over a six-week period in 2014, which identified that 21% of attendances at the ED were referred from 1177.[110] While results between countries are not comparable, it is noted that in England, 9.6% (n=1.14 million) of callers to NHS 111 in 2018 were advised to attend an ED.[127]

In the first five years of NHS 24 in Scotland, the proportion of NHS 24 calls that required no further action from OOH GP, ambulance or ED services rose steadily to 40% by April 2005.[54] This resulted in a substantial decrease in OOH GP telephone advice calls, and the overall number of contacts at OOH GP cooperatives, alongside a decrease in the proportion of calls requiring a home visit and an increase in centre consultations.[54] Analyses of the pattern in the source of in-hours ambulance call-outs and the destination of ambulances show they were generally similar before and after the introduction of NHS 24. The study also reported that the introduction of NHS 24 had no effect on overall ED activity.[54]

The identified studies from England highlighted that comparing service levels pre- and post-implementation of NHS 111 is complex. Difficulties arise as a result of the

presence of NHS Direct services as a predecessor to NHS 111 and the concurrent, staggered decommissioning and implementation of these services. Staff at NHS 111 reported a perceived increase in non-urgent calls since the introduction of NHS 111 compared with previous OOH primary care services. However, stakeholders perceived the benefits of NHS 111 during the pilot phase to be improved access for callers to appropriate care while managing demand, streamlined care, improved GP OOH care, and integration within the urgent care system.[45]

NHS England figures report that over 12 million unnecessary visits to EDs and over three million 999 calls which could have resulted in unnecessary ambulance call-outs were prevented from April 2011 to September 2018 as a result of NHS 111.[128] Conversely, a summary analysis of published NHS England monthly performance updates highlighted that since its inception, NHS 111 has referred an increasing number of people to emergency services, in particular ambulance dispatch.[132] The authors suggest that this was as a result of NHS 111 operators being risk-averse. This was also found in a 2013 evaluation report of the pilot phase of NHS 111 where a small, but statistically significant increase in monthly ambulance activity across the pilot sites was reported.[45]

Studies using data linkage with either regional or national NHS data have investigated the degree of non-urgent referrals or avoidable attendances to emergency services associated with NHS 111 use.[125, 126] A review of calls to NHS 111 in the NHS Yorkshire and Humber region, in the four years from 2013 to 2017 (n=3,631,069), noted that 5% of those involved callers being taken to the ED via ambulance, and 17% of all ED referrals from NHS 111 were classed as non-urgent by the authors.[126] Another study, using a national-level dataset of NHS 111 calls, concluded that where callers were not advised to attend an ED (n=12,894,561), one in every 20 calls still resulted in avoidable ED attendances.[125] A prospective study of NHS 111 contacts in a regional centre explored the outcome of calls passed to a clinical assessment service. The authors reported that, in the pre-intervention year, 80% of callers were advised to attend ED within one to four hours. Post-intervention there was a 75% to 81% reduction in cases referred to the ED, with between 19% and 25% of callers referred.[123] Two studies from Osaka, in Japan, reported on the reasons for callers calling an ambulance after contacting a telephone triage service and reported the most common reason to be acute disease (88%).[52, 152] However, one of the studies reported a lower odds of unnecessary ambulance use in Osaka in telephone triage service users compared to propensity score matched non-users (odds ratio (OR) 0.49, 95% CI: 0.43 to 0.59).[52, 152]

Five studies were identified that explored the impact of telephone triage advice on caller intention and subsequent resource use.[107, 108, 118, 119, 150] A 2009 regional evaluation of the 1177 service in Sweden found that 45% of telephone consultations (n=159) resulted in a different level of care being advised than the caller's initial intention.[118] Of these calls, 23% (n=67) were referred to a less urgent level of care and 22% (n=64) were referred to a more urgent level of care. Thirteen per cent of calls (n=36) resulted in a primary care visit with no resource savings based on the caller's initial intentions and the authors' assumption that this visit was necessary and there was no alternative.[118] The influence of nurse-led self-care advice on healthcare utilisation in Sweden was explored in a cross-sectional postal survey of 1177 users in a 30-day period in 2014.[107] The results show that self-care advice had a constricting effect on healthcare utilisation, with 66% of respondents (n=148) reporting a lower level of care required than initial intentions.[107] A 2011 study found that in cases of triage to a lower level of care to the caller's initial intention, if there was disagreement between the caller and the nurse's advice, it may have resulted in an increase in avoidable visits to higher levels of care.[108] In Switzerland, a regional analysis of call data from the telephone triage service reported a 28% decrease in the intention to visit ED after a telephone triage call.[119] Similarly in Australia, Nurse-On-Call advised 83% of callers with an initial intention to ring an ambulance to take less urgent action and only 29% of those who had planned to attend an ED were advised to do so immediately.[150]

Overall, studies from five countries examined the impact of the telephone services on ED utilisation. Of these, two reported a positive effect such as reduced demand or avoidance of unnecessary attendances, while three showed either no effect or conflicting results. As such, the international evidence did not clearly demonstrate whether a telephone service leads to reductions in ED presentations. Three countries reported on the impact on primary care services, of which, two studies found a positive effect, while one reported a negative impact. The impact on ambulance use was reported in four countries, two should positive effects such as reduced demand, while the other two had inconclusive findings. Overall, there was conflicting evidence of the impact of a telephone service on healthcare utilisation.

Table 3.6. Impact on other services – direction of effect

Country	Impact on other services		
	Primary care*	Emergency department	Ambulance
Denmark†		‡	
Sweden			
England		◇	◇
Scotland		‡	‡
Australia			
Japan			

Key: Positive impact (for example: avoid unnecessary resource use, decreased demand)
Inconclusive impact (‡ no effect or ◇ conflicting reports)
Negative impact (increased demand, avoidable attendances)
* Primary care incorporating out-of-hours services
† Primary care impact based solely on out-of-hours service in Denmark

3.5.3 Appropriateness, safety and compliance

3.5.3.1 Appropriateness

Disposition is the term used to describe the assigned destination of the caller within the care pathway. In the context of this report, it considers what advice the caller received following a call to an acute, non-urgent telephone service. A total of 30 studies reported on the range of dispositions assigned to calls to acute, non-urgent telephone services across all included countries. [44, 45, 54, 76, 92, 93, 105, 108, 115, 117-121, 123-127, 131, 134, 135, 138, 139, 142, 143, 145, 148, 151, 154] Dispositions are reported for the pathway destinations of: self-care advice, primary care, ED, ambulance dispatch or referral to other services such as pharmacy, dental services or specialist doctors. Table A13 in Appendix A provides detail of the dispositions reported. Overall, across all age groups, the majority of callers were advised to visit their GP or other local service (9% to 69%).[44, 45, 54, 76, 92, 93, 105, 108, 117-121, 123, 125-127, 131, 134, 135, 138, 139, 142, 143, 148, 151] Generally, within studies, fewer callers were advised to attend the ED (5% to 49%) while a similar proportion of callers received self-care advice (7% to 51%).[44, 45, 54, 76, 108, 115, 117-121, 123-127, 131, 134, 135, 138, 139, 142, 143, 145, 148, 151, 154] Of note, direct comparison across studies and countries is not possible due to a wide variation in reported percentages as a result of diversities in methodology, caller populations, timeframes, reported destinations and also the maturity of services at the time of analysis. Furthermore, the design of acute, non-urgent telephone services including the hours of operation, the availability of and access to potential healthcare dispositions such as OOH GP care will also affect the advice given.

Appropriateness in the context of acute, non-urgent telephone services refers to whether or not the caller received suitable advice to address their health concern. Advising the caller to seek the appropriate care could potentially save resources whereas over-triage (that is, referral to a higher level of care than is needed) could lead to overuse of the healthcare system and under-triage (advice or referral to a lower intensity of care than is needed) could result in safety issues for the patient (see Section 3.5.3.1.1). Eleven studies from five countries described the appropriateness of the advice callers received.[45, 92, 93, 98, 99, 103, 124, 142, 144, 148, 155] The key findings are presented in Table A12 in Appendix A. Table 3.7 provides a high-level impression of overall appropriateness as reported by country.

Three studies considered the issue of over-triage to a higher level of care when a lower level care would have been more appropriate.[92, 93, 148] In Australia, the initial disposition in the Healthdirect triage pathway is generated by a clinical software package using clinical decision algorithms. One study reported that, out of 291 calls analysed, 10% of the calls (n=29) were assessed by physicians to have been over-triaged by the triage algorithm.[148] Similarly, a study from Belgium assessed over-triage based on the assignment of care protocols.[93] The study found that 22% of the calls allocated to 'unwell for no reason' protocol (n=36) were over-triaged. Two studies from Belgium reported that, when physicians assessed the advice given by telephone triage call operators, the proportion of calls assessed to require a lower level of care ranged from 5% to 12%.[92, 93]

Four studies considered the issue of under-triage to a lower level of care when a higher level of care would have been more appropriate.[92, 93, 148, 155] The proportion of calls that were considered to have been under-triaged ranged from 0.8% to 18%.[92, 93, 155] A study from Australia found that 47% (n=35) of calls where the triage algorithm provided the initial disposition to see a doctor were under-triaged.[148] Another study from Australia found that a large proportion of under-triage was related to the vomiting toddler triage algorithm.[148] The same study reported that among adult callers, under-triage occurred in slightly greater proportion of calls related to limb pain (17%) compared to abdominal pain (12%) and was more likely among adults aged between 50 and 70 years of age (27%) and those aged 70 years and older (20%).[148]

Two studies reported on appropriateness and safety of the disposition to self-care or non-acute care.[138, 144] A study from Scotland identified that 0.1% (n=99) of callers were admitted to hospital within seven days of being advised to self-care by the telephone triage service and 0.3% (n=27) were categorised with an 'acute and serious' diagnosis.[138] A study from Australia found that among callers who were

referred for non-acute care or self-care, the appropriateness of referral was 58% (n=15, 95% CI: 37% to 76%).[144]

Two studies reported on appropriateness of the disposition to primary care.[93, 144] In a study from Australia, among callers who were given the advice to see a GP in an expedited manner, the advice was considered as an appropriate referral in 71% of cases (n=181, 95% CI: 65% to 77%).[144] A study from Belgium assessed that of the calls allocated to a specified primary care protocol, 11% (n=22) were under-triaged while 12% (n=24) of the calls were over-triaged.[93]

Three studies from Australia reported specifically on appropriateness of attendance at the ED.[142, 144, 148] One study assessed that, of 534 calls to Healthdirect, 48% of callers (n=254) were advised to visit the ED and this was considered appropriate in 78% of cases (n=198, 95% CI: 72% to 83%).[144] The study reported 90% of the ambulance referrals in the Healthdirect-referred group was appropriate (n=87, 95% CI: 84% to 96%).[144] The same study also compared the appropriateness of referral to the ED between GP-referred, self-referred and Healthdirect-referred patients in a sample of 720 patients in each group. The study found a significantly higher level of appropriateness of referrals among GP-referred patients (90%, n=646, 95% CI: 88% to 92%) compared with Healthdirect-referred patients (73%, n=525, 95% CI: 70% to 76%) and self-referred patients (74%, n=531, 95% CI: 71% to 77%).[144]

Another study, conducted in a single ED in Australia, found that significantly fewer patients who had called Healthdirect needed medical attention within 120 minutes compared with patients who had not called Healthdirect prior to attending the ED (Healthdirect callers: 7.8%, 95% CI: 7.6%-7.9%, general attendees: 17%, 95% CI: 16.9% to 17.0%). Among callers who had self-referred to the ED following advice from Healthdirect to seek primary care, the study reported that significantly fewer needed medical attention within 10 minutes compared with callers who had not called Healthdirect (Healthdirect callers: 4.0%, 95% CI: 3.8% to 4.3%, general attendees: 8.3%, 95% CI: 8.3% to 8.4%).[142]

In considering factors that influence the over-triage of advice to attend an ED, another Australian study found that failure of the Healthdirect nurse assisting the caller to identify lower-acuity care other than the ED contributed to the escalation of the advice. For case pathway 2, where the caller disagreed with the nurse to see a doctor in the community and instead intended to visit the ED, caller factors such as anxiety or nervousness and their initial intention contributed to the likelihood of the caller attending the ED when they received advice to seek primary care. Finally, call assessors were less likely to consider the advice to attend ED immediately to be

inappropriate if the caller was calling from a rural location.[148] See Appendix A Table A12 for further detail.

Table 3.7. Overall appropriateness

Country	Overall appropriateness
Belgium	
Denmark	
England	
Australia	
New Zealand	

Key: Positive direction of appropriateness (>70% for overall appropriateness and <15% for under-triage or over-triage)
Inconclusive direction of appropriateness

3.5.3.1.1 Safety

Safety of the acute, non-urgent telephone service refers to the protection of callers from harm resulting from their use of the service. This could include harm due to delay, error, unplanned attendance at the ED and unplanned hospital admissions after being given a lower level of care advice or being under-triaged. The section below focuses on the findings from seven studies from five countries that analysed safety concerns as a result of using an acute, non-urgent telephone service.[44, 105, 109, 111, 138, 150, 152] The key findings are presented in Appendix A. Table 3.8 provides a high-level impression of overall safety. Overall safety has been subjectively categorised at a country level into above-average safety (<10% of calls had safety concerns) and inconclusive (findings vary among studies reported within a country). The threshold was determined based on a previous scoping review, which identified that on average 10% of all contacts with the acute, non-urgent telephone service are potentially unsafe.[192]

Two studies reported the number of unintended incidents as a result of the disposition (triage outcome) received from a telephone triage service.[44, 150] Unintended incidents refer to occurrence of adverse events in connection with the advice given through the telephone triage service. An Australian study reported a low number of unintended incidents (105 incidents out of 1.47 million calls) and a Danish study reported 236 incidents in 2016 (total number of telephone consultations for the emergency number 1813 in 2016 was 435 per 1,000 citizens).[44, 150] A study from Finland found that while unintended incidents were recorded for 12 callers, these were not found to be linked with the telephone triage service.[105] In six out of the 12 cases, the level of triage provided by the Emergency Medical Communication Centre was upgraded by the triage nurse. Three patients required intensive care and three patients died within 48 hours.[105] Another study

from Japan found an inverse association between the use of telephone triage service and occurrence of an "unfavourable outcome" such as hospital admittance, transfer or death after care in the ED (adjusted OR: 0.85, 95% CI: 0.81 to 0.90).[152] One study from Sweden reported on malpractice claims. Malpractice claims refer to the mandatory reporting of medical error which is done through the submission of a report to the responsible authority.[111] The study reported 35 malpractice claims between 2011 and 2018. In 17 of these calls (49%), there was more than one call to Swedish Healthcare Direct in connection with the malpractice claim.[111] In these reported events, the severity of the caller injury was high and 29% of the affected callers had died. The commonly reported reasons for medical error were telephone nurses' communication, decision process and organisational deficits.[111]

Four studies compared the differences in the appropriateness and safety of telephone triage by profession.[99, 103, 124, 155] Two studies from Denmark reported that compared to GPs, nurse-led calls were at significantly higher risk of being over-triaged (RR: 2.1, 95% CI: 1.05 to 4.07 and RR: 3.9, 95% CI: 1.5 to 10.3).[99, 103] A study from England reported that, in calls that were assessed by a GP, the GP advised an alternative to ED attendance in 73% of the cases (n=1,074) where the caller was advised to attend the ED by the call operator. Alternatives included attendance at a minor illness and injury unit in 5% of cases (n=76), attendance at OOH primary care in 40% of cases (n=589), and self-care advice in 28% of cases (n=409).[124] In contrast, a study from New Zealand reported that in 71% of cases analysed (n=64), GPs triaged to within one endpoint reached by the Healthline nurse.[155] In 11% of cases analysed (n=10), the results showed that doctors advised a lower level of care. Of note, in one study in Denmark, independent assessors assessed the quality of the calls and reported that compared with telephone triage by GPs, the communication quality was higher in calls triaged by nurses and quality of communication was associated with accurate triage.[98]

Table 3.8. Overall safety

Country	Overall safety
Denmark	
Finland	
Sweden	
Scotland	
Australia	

Key: <10% of calls had safety concerns
Inconclusive

3.5.3.2 Compliance

Compliance refers to the extent to which a caller's behaviour matches the advice given.[193] Adherence relates to the extent to which a caller's behaviour matches agreed advice, the word "agreed" indicating a more proactive role of the caller than compliance.[193] However, these terms may often be used interchangeably in the literature, with the studies identified in this review using the term compliance to refer to both the adherence and the compliance of callers. As such, the term compliance will be used throughout this report.

Table 3.9 provides an overview of overall compliance with advice. Twenty studies reported on compliance with the advice provided through the acute, non-urgent telephone service.[45, 116, 119-123, 126, 127, 131, 138, 140, 142, 143, 145, 146, 150, 151, 153, 154] Fourteen studies from six countries reported on compliance with the following dispositions (triage outcomes): self-care, primary care, emergency care and other services (such as mental health services), a district nurse, or midwife (see Table A14 in Appendix A).[116, 120, 121, 126, 127, 138, 140, 142, 143, 145, 146, 150, 151, 154] In 15 studies, compliance rates were determined by examining linked telephone triage service and healthcare service use records.[116, 120, 122, 123, 126, 127, 138, 142, 143, 145, 146, 150, 151, 153, 154] In the remaining five studies, compliance rates were determined using postal or online surveys.[45, 119, 121, 131, 140]

In the four studies reporting on compliance with a self-care disposition, the compliance rate was over 75% in each study.[116, 120, 143, 151] Four studies reported non-compliance with the self-care advice received ranging from 7% to 19%.[120, 126, 138, 143] One study reported that for calls resulting in self-care advice, compliance was higher in relation to calls for children aged 0–4 years than for adults aged 50 years and older (85.6% and 78.9% respectively).[151] The study also found similar compliance rates with a self-care disposition between males (83.8%) and females (83.6%).[151] Based on two studies, there was no clear difference in compliance by socio-economic status or whether the call was made OOH or in-hours. [143, 151] One study identified that people who had originally intended to self-care (80%) had higher compliance with self-care advice compared with those who originally intended to go to the ED (73%).[143] Where callers did not comply with the advice received, they reported attending another service.[138, 143] For example, in Scotland, within 24 hours of being advised to self-care, 11% of callers attended another service.[138] In studies from England and Australia, within 24 hours of being advised to self-care, 7% to 18% of callers attended the ED.[126, 143]

Among callers advised to seek primary care within a certain timeframe, compliance rates ranged from 35% to 91%.[116, 120, 143, 146, 150, 151] For those advised to attend

primary care, compliance was higher among people calling OOH (44% to 65%), people of middle to higher socio-economic status (42% to 67%) and among those who originally intended to attend emergency care (70%).[143, 151] Two studies presented this information as rates of non-compliance.[120, 126] One study reported a rate of 65% non-compliance among callers who received the advice to seek primary care.[120] Another study reported that among people advised to seek primary care, 9% of the callers attended the ED.[126] Ten studies reported levels of compliance with advice to attend the ED immediately ranging from 29% to 91%.[120, 121, 126, 127, 142, 143, 145, 146, 151, 154] Five studies presented this information as rates of non-compliance, ranging from 8% to 57%.[120, 126, 127, 138, 154] Higher compliance with the advice to seek emergency care was seen among people in the middle to higher socio-economic status quintile (52% to 73%), people calling OOH (53% to 70%) and callers who originally intended to attend the ED (73% to 77%).[142, 143, 151] A study from England reported that 67% of callers complied with the advice to seek care from other services.[120] Three studies reported that 16% to 33% of callers did not seek care from other services when advised to do so.[120, 126, 138] A study from Scotland also found that 39% (n=219) of callers contacted another health professional after calling NHS 24.[140] Of these callers, 72% (n=157) had been advised to do so, 24% (n=53) contacted another health professional based on their own decision and 4% (n=9) did so based on the advice of their family.[140]

Table 3.9. Overall compliance with advice

Country	Number of studies	Compliance
Sweden	1	
England	7	
	1	
Scotland	2	
Switzerland	1	
Australia	3	
	2	
Canada	1	
New Zealand	1	

Key: Positive direction of compliance (>60% for overall compliance or with advice for self-care, emergency care or primary care)δ
Inconclusive direction of compliance
Negative direction of compliance (<60% for overall compliance or with advice for self-care, emergency care or primary care)

δ Some studies have only mentioned overall compliance while other studies have categorised it as compliance with self-care advice, compliance with the advice to visit primary care or emergency care.

Seven studies reported levels of compliance ranging from 49% to 97% with the overall advice callers received from a telephone triage service.[45, 119, 120, 122, 123, 131, 150] Six studies reported levels of non-compliance, which ranged from 3% to 51%.[45, 119, 120, 122, 131, 153]

Table A15 and Table A16 in Appendix A detail the reasons for non-compliance and the factors influencing compliance. Overall, rates of compliance were similar for women and men (49% versus 50%) and compliance was found to be higher among children and people calling OOH.[120] Two studies reported high compliance among the younger population (aged 0 to 15 years).[120, 142] A study among adults reported higher compliance rates for adults aged 55 years and older, specifically with advice to attend the ED or to seek primary care.[143] In contrast, another study reported lower compliance among adults aged 50 years and older for all dispositions (triage outcomes).[151] Three studies considered the callers' reasons for non-compliance with the advice given.[45, 121, 131] The most common reasons for non-compliance were disagreeing with the advice, being unable to follow the advice (for example, appropriate care for other children could not be found), the lack of availability of an alternative option (such as an OOH pharmacist), and travel time.[45, 121, 131] For example, lower compliance rates with the advice to attend the ED were observed in people who lived farther away from the nearest ED (39% in those with a drive time of less than five minutes compared with 13% in those with a drive time of 40+ minutes).[142, 143, 154]

Four studies reported on both compliance and appropriateness or safety of the telephone triage advice.[45, 138, 142, 150] Conclusions cannot be drawn for any causal effect relationship between appropriateness or safety of the acute, non-urgent telephone service and compliance with the advice received from the telephone service. However, it could be observed from the three studies that reported either a higher proportion of compliance or a lower proportion of non-compliance that there was also a high proportion for overall appropriateness or a low proportion of safety concerns.[45, 138, 142] For the remaining study, the information was inconclusive for compliance with the advice received from the telephone service, while the study reported a low proportion of safety concerns.[150] Table 3.10 provides a high-level impression of the direction of overall compliance and appropriateness.

Table 3.10. Overall compliance and appropriateness

Country	Overall compliance	Overall appropriateness or safety
England[45]		
Scotland[138]		
Australia (New South Wales)[142]		
Australia (Victoria)[150]		

Key: Positive direction of compliance or appropriateness and safety (>60% compliance with the advice or <20% level of non-compliance >70% for overall appropriateness or ≤10% of safety concerns)
Inconclusive direction of compliance or appropriateness or safety

3.5.4 Costs

A total of 11 studies from seven countries (Denmark, Sweden, England, Scotland, Australia, Canada and Japan) provided information on a variety of costs.[43-45, 54, 76, 118, 122, 124, 136, 147, 150] Table A17 in Appendix A provides an overview of the types of methodologies and costs included and reported. Costs reported included the initial cost of setting up the service including capital costs, the ongoing cost of delivering the service, the cost per caller, and potential resource savings.[44, 45, 54, 118, 122, 124, 136, 150] Of note, it is not possible to directly compare costs across studies and countries. This is as a result of differences in the acute, non-urgent telephone services being delivered, the costing methodologies employed, the types of costs included and the maturity of the telephone service at the time of analysis. To aid in the interpretation of costs across currencies, costs are converted to euros in the relevant year and estimated as euros in the text that follows. The original currency costs are reported in Table A17 in Appendix A.

Initial set-up costs and capital expenditure were reported in studies from Scotland, Australia and Japan.[54, 76, 150] The cumulative capital and set-up costs of NHS 24 in Scotland were reported at €36.1 million in the five-year period from 2000 to 2005. Capital costs were highest from 2001 to 2003 as the service was being established and contact centres were developed. Capital costs reduced substantially in later years, from €14.8 million in 2002/03 to €1.1 million in 2004/05. In Australia, the government provided €5.3 million per annum for three years (2006 to 2009) to set up Nurse-On-Call in Victoria.[54, 150] The set-up cost for the Japanese acute, non-urgent telephone service in Tokyo was estimated at €2.6 million during the first year (2006/07).[76]

The ongoing cost of providing an acute, non-urgent telephone service was reported in eight studies from six countries (Denmark, Sweden, England, Scotland, Canada and Australia).[43-45, 54, 118, 136, 147, 150] The annual cost of running the Capital Region of Denmark's Medical Helpline 1813 in 2016 was estimated at €13.3 million, with salary costs representing more than 88% of this total, premises costs 2%, transport costs 5% and technology costs 5%.[44] In Sweden, the annual cost for running the national 1177 hotline telephone service in the region of Östergötland in 2008 was estimated at €1.8 million.[118] Of this, 76% was staff-related pay expenses. In England, an evaluation of the first year of operation of NHS 111 in four pilot sites estimated a monthly cost of €234,473.[45] This estimate was extrapolated to estimate a total impact for the NHS of approximately €360,833 per month, with a wide 95% confidence interval. Probabilistic parametric sampling was utilised to quantify this uncertainty and it was estimated that there was a 21% probability of NHS 111 being cost saving. However, these figures are subject to uncertainty and no subsequent analysis was identified in this review. In Scotland, the annual revenue cost of running NHS 24 in 2004/05 was reported as €59.8 million, with salary costs representing 66% of this total. Including capital investments, the annual cost was €65.2 million.[54] Of note, at the time of this analysis, NHS 24 had not yet completed a full year operating at full capacity. By 2022/23 the annual cost of NHS 24 was €119 million with salary costs representing 73% of annual revenue costs, technology costs 17% and property and administration costs 10%.[136] These figures include the costs of other services provided by NHS 24 such as the NHS 24 Online app and as such they do not reflect the actual cost of running the NHS 24 telephone line as a distinct service. The average cost in Scotland was estimated at over €5.4 million per month in 2005.[54] The annual cost of running the national service Healthdirect Australia in 2022/23 was €116.7 million, with call centre costs making up 66% of this total, salary costs 22%, technology costs 5%, development costs 2% and marketing and advertising costs 1%.[147] The annual cost of providing a regional telephone service in Victoria, Australia in 2010 was reported as €6.2 million.[150] Costs from Alberta-Canada were not identified, but a health technology review of telephone triage services in Canada in 2023 reported total annual costs ranging between €375,018 and €28.5 million.[43] These costs varied substantially among jurisdictions and were dependent on factors such as population size, the number and types of professionals involved, and the scope of services provided.

The cost per call was reported by five studies from four countries (Denmark, Sweden, England and Scotland).[44, 45, 54, 118, 122] As noted above, these costs were converted to euros in the relevant year and reported as euros in the text that follows, with the original currency costs reported in the table below. In Denmark, the average cost per call was estimated at €12.27 in 2016, and in Sweden the cost per

call was estimated at €9.14 in 2008.[44, 118] In England, the estimated average cost of a call to NHS 111 during the pilot period (2010/11) was €14.37. A more recent study from 2021 estimated the cost at €13.36 per call.[122] The average cost per call in Scotland was estimated at €51.01 in 2005.[54] Of note, the cost estimates for Sweden and Scotland also include calls to other services.

The issue of resource saving was explored in six studies from Sweden, England, Scotland, Australia and Japan.[54, 76, 118, 122, 124, 150] In Östergötland, Sweden, the gross effect of providing an acute, non-urgent telephone service, based on the number of callers who were triaged to a lower or higher level of care, was estimated at €8.3 million (95% CI: €5.8 million to €10.9 million).[118] These results were extrapolated to estimate a cost saving at a national level of resources worth €215 million per year at a cost of €45.7 million.[118] However, due to assumptions used in their analysis, caution should be advised when interpreting these figures. In England, the potential for cost savings if a GP was employed to review the advice given by NHS 111 call handlers was explored.[124] Based on a review of 1,474 cases, there were theoretical cost savings of €62,250 in relation to ED use due to fewer dispositions (triage outcomes), but an additional cost of €49,081 from employing GPs to review call advice. A 2021 report found that running a parallel online service, NHS 111 Online, alongside the NHS 111 telephone service, with substitution of more than 38% of calls by the online service, resulted in a combined service that was less expensive than operating the NHS 111 telephone service alone.[122] In Scotland, when costing users' alternate action if NHS 24 were not available across a range of low-, mid- and high-cost estimates for alternate services such a pharmacy, GP or EDs, it was estimated that NHS 24 could cost between €18.9 million more to €34.9 million less.[54] This equates to an incremental cost per NHS 24 call of between €14.75 more and €27.26 less than alternate services.[54] Furthermore, the analysis considered the volume of alternative service utilisation that would have to be offset for NHS 24 to be considered cost neutral. For this to occur, calls to NHS 24 would have to be a direct annual substitute for between 1.75 and 2.4 million hours of GP consultations, or 793,000 to 2.4 million OOH consultations, 434,000 to one million ED attendances, or a combination of the above.[54] Alternate demand scenarios were also assessed, using low, mid and high costs for both GP in-hours and OOH services. The incremental cost per call of consulting NHS 24 compared with GP services is highly dependent on the costs used in the analysis. At lower GP costs, the incremental cost per call of using NHS 24 compared with attending a GP would be more expensive whether in-hours or OOH, at between €23.61 and €23.86. At both mid and high GP costs, the use of an in-hours GP consultant is still less expensive than NHS 24, with an incremental cost per NHS 24 call remaining over €13.85. The use of OOH GP services or a combination of 90% in-hours and 10% OOH GP

services were both more expensive than the cost of an NHS 24 call, with incremental cost per NHS 24 calls of between €1.16 and €31.19 less per call. Nurse-On-Call in Victoria, Australia, was reported to provide an annual resource saving of approximately €2.9 million in 2008 for callers who had originally intended to attend the ED or call an ambulance.[150] Finally, in Tokyo, the resource saving for the ambulance service associated with decreased dispatches in the first year of the 7119 telephone advice line was estimated at €8 million.[76]

3.6 Discussion

This scoping review was undertaken to assess the evidence for the impact on health outcomes and healthcare delivery for any identified operating telephone services (distinct from the 112/999 emergency service) for acute, non-urgent medical care needs in the pre-hospital setting. Overall, 71 primary research studies were identified for inclusion from across 11 OECD countries. Eighteen studies were conducted in England, 13 in Sweden, 12 studies in Denmark, nine in Australia, seven in Scotland, four in Japan, two in each of Canada (Alberta), Belgium and New Zealand, with one study each identified for Finland and Switzerland.

3.6.1 Identified acute, non-urgent telephone services

Internationally, the provision of an acute, non-urgent telephone service to meet the needs of the general population in the pre-hospital setting varies. While the rationale for implementing an acute, non-urgent telephone service is broadly similar across countries, that is, to reduce ED attendance and provide timely assistance and appropriate care, each country is unique in terms of the existing healthcare system in which the service has been implemented, the maturity of the telephone service, and the level of analysis conducted on the service. Among the countries considered in this scoping review, key points of similarity and difference can be highlighted that should be considered in the Irish context.

There are several key similarities between Ireland's healthcare system and those of Denmark, Sweden, England, Scotland and Australia. Each country has a healthcare system that is predominantly publicly funded, in which a significant portion of healthcare services is financed through taxation or government funding. These countries note a commitment to providing universal healthcare coverage to their populations, meaning that all residents, regardless of their socio-economic status or employment status, should have access to essential healthcare services with limited financial barriers. While each country has publicly-funded healthcare systems, they also incorporate elements of private healthcare provision. Each of these countries also report facing similar healthcare challenges, including rising demand and

increasing pressure for urgent care services, aging populations, and the need to improve access to timely assistance and appropriate care.

Despite these similarities, it is important to note that there are also differences among the healthcare systems of the countries considered in this scoping review, such as variations in funding mechanisms, healthcare delivery models, and governance structures. It is notable that Denmark, Sweden, England, Scotland and Australia all have well-established national patient identification numbers which allow access to patient medical records across a variety of settings.

Geographical location is a known factor determining access to OOH and emergency care. Long distances between rural or remote residences and health services may serve as a barrier of cost, time and inconvenience. Non-urgent visits to EDs can also arise where OOH services are less accessible than an ED.[8, 194] Table A18 in Appendix A provides an overview of the population density of the countries considered in this scoping review. The average population density varies between 3.3 and 438 persons per square kilometre.[195, 196] However, within countries, it is also important to consider the distribution of these populations, including the proportion of the population living in urban versus rural or remote areas, and differences in population density by area type. In Sweden and Denmark, over 88% of the population live in urban areas. Australia, for example, has the lowest of all average population densities, but also has the largest differential in population densities between urban and rural areas. Such large differences in population distribution present unique difficulties to delivery of health services. A large area of Australia is either uninhabited or has a small number of inhabitants, compared with the Melbourne central business district which has the highest population density encountered at over 38,000 persons per square kilometre. Ireland's geographical characteristics, such as its rural population distribution and dispersed healthcare infrastructure, may present unique challenges that differ from those faced by the other countries considered in this review. For example, Ireland has very few uninhabited areas, but large portions of the country have relatively low population density. The consequence is that healthcare services often have catchments that cover large geographic areas to achieve an adequate population coverage, creating challenges for accessibility.

3.6.2 Impact on health outcomes and healthcare delivery

Due to the wide variety of outcomes considered in the identified studies and the variety of models of acute, non-urgent telephone services implemented internationally, it was not possible to pool data on health outcomes and the impact of implementing an acute, non-urgent telephone service on healthcare delivery.

Instead, a number of key outcomes were identified in the literature and, where possible, patterns across the studies and were drawn out narratively.

3.6.2.1 Effectiveness

Considering who is using the acute, non-urgent telephone services identified in this scoping review, the results show that callers were slightly more likely to be female, and either calling for themselves (range: 31% to 83% across studies), or they were a parent or carer calling on behalf of a child (range: 19% to 45% across studies). The largest user subgroup of callers was those aged 20–65 years (50%) followed by people aged 0–20 years (35%) and finally those aged 65 years and older (15%). In the paediatric population, the most represented caller group was one- to four-year-olds. These proportions largely reflect the age distribution of the population, and suggest that calls are made by and for people of all ages, reflecting a wide spectrum of possible medical issues. Callers reported a consistently high level of satisfaction. However, satisfaction was affected by call waiting times, perceived quality of communication, caller expectations, and agreement with the advice received.[44, 45, 54, 100, 102, 108, 118, 119, 140, 147, 150] Callers also highlighted the lack of consideration of rural and remote communities in service delivery across countries.[102, 140, 141, 149] An Australian report noted that individuals from non-English language backgrounds, and those with hearing and speech impairments, were significantly under-represented in those accessing acute, non-urgent telephone services.[150]

In terms of how the acute, non-urgent telephone services are used, all countries included in this scoping review noted a steady increase in calls to the pathway over time as the service was bedded into the wider healthcare system. However, service targets for answering calls within timeframes and minimising abandoned calls were consistently missed across countries. Across countries, the targets for time to answer calls ranged from as low as 20 seconds up to 10 minutes.[44, 45, 130, 132-136, 150] Approximately one third of callers reported using the service because they did not know what course of action to take, while a quarter originally intended to call a GP. Less than 20% of callers had the original intention to call an ambulance or attend ED. The reason for calling the telephone service was more frequently reported as due to illness rather than injury. In England and Scotland, where NHS 111 and NHS 24 services operate 24 hours a day, call volumes were considerably higher outside of normal office hours, with figures ranging from 82% to 90% of calls being made in the out-of-hours period. Reasons for service use centred around the accessibility of GP and OOH services such as the convenience of not having to leave home and having access to early medical attention without an appointment.[102, 140, 141, 149] Barriers to its use included having readily accessible GP or ED services in the area,

difficulty in communicating an illness over the phone, and a lack of knowledge and awareness of how to access the services. An acute, non-urgent telephone service can potentially improve the timeliness of access to the appropriate healthcare resource for service users.

The impact of introducing an acute, non-urgent telephone service must be considered in terms of the effect it may have upon other health system stakeholders such as primary care and OOH services, EDs, and ambulance services. However, due to differences in models of service delivery and the metrics reported, results across service areas were not comparable. There are reports of positive impacts upon OOH GP services, with decreasing requirements for on-call home visits in Denmark and Scotland. However, an increase of in-hours primary care contacts was noted in Sweden and Scotland. Reports of the impact upon ED attendance varied. Positive impacts in terms of reduced ED presentations and prevented ambulance call-outs have been reported in Sweden, England, Australia and Japan. However, there were also conflicting results from England, with two studies reporting an increase in ambulance activity. Reports from Denmark and Scotland demonstrated no effect on overall ED and ambulance activity after the introduction of acute, non-urgent telephone services. Furthermore, impacts may often occur across multiple services concurrently. Unless a call is closed with self-care advice, the outcome of a call is not to eliminate the need for care, but to potentially change the setting in which care is delivered. The main effect may be a shift in resource use among different healthcare settings.

3.6.2.2 Appropriateness, safety and compliance

For triage advice to be considered appropriate and safe, the level of under-triage and over-triage to a different level of care is an important consideration. The results from this scoping review show that the proportion of calls considered to have been under-triaged ranged from 0.8% to 18% and the proportion of over-triaged calls ranged from 5% to 22%. Considering the appropriateness and safety of triage advice by profession, the results show that GPs were more likely to advise a lower level of care than nurses, but that callers to the acute, non-urgent telephone services assessed the communication quality to be higher in calls triaged by nurses.

Poor compliance with triage advice might lead to inefficient resource use, and impaired clinical outcomes. Poor compliance also undermines the purpose of the acute, non-urgent telephone service, which is to ensure healthcare is accessed in the most appropriate setting. Improving compliance with advice could streamline and speed up the response to healthcare needs.[120] While triage disposition varied across studies, across all age groups, the most common advice given to callers to

acute, non-urgent telephone services was to visit their GP (9% to 69%), followed by advice to attend the ED (5% to 49%), or self-care advice (7% to 51%). These ranges illustrate the variability across countries and studies in terms of the advice given. Across the countries considered in this scoping review, studies reported a positive direction of compliance overall for disposition (triage outcome) to visit the GP, attend the ED, and self-care advice. The factors affecting compliance most strongly were the time of the call, socio-economic status of the caller, and the advice given. The results show that for all call dispositions, compliance rates were higher among people calling OOH and people of middle to higher socio-economic status. Compliance rates were also higher when the caller agreed with the triage outcome.

3.6.2.3 Costs

The impact that an acute, non-urgent telephone line has on health services in terms of resource utilisation is important. Introduction of an acute, non-urgent telephone service has the potential to free up healthcare resources such as ambulance or emergency department capacity. However, the opportunity cost associated with the capital and revenue required to set up and run such a service must be considered. It is not possible to directly compare costs across services as a result of differences in the acute, non-urgent telephone services being delivered, the costing methodologies employed, the types of costs included, and the maturity of the telephone service at the time of analysis. Despite this, with the exception of Scotland where the reported cost per call in 2005 was equivalent to over €50 per call, there was some consistency in the cost per call in Denmark, Sweden and England, ranging from an estimated €9.14 to €13.36. However, it can be seen that such services are expensive to set up and run, with annual costs ranging from €1.8 million for a regional service covering 423,000 persons to €119 million for a mature national service covering 5.5 million persons, depending on the services provided.[118, 197] Reported cost offsets due to resource reallocation did not cover these set-up and ongoing running costs. Potential benefits may arise through reduced demand for ED attendance and face-to-face GP consultations, for which the evidence is mixed. The findings also highlight that even if service demand patterns change, the extent to which costs can be offset is complex to quantify as they can occur across a range of sectors.[54] The feasibility of an acute, non-urgent telephone service to achieve resource offsets may be limited if lower categories of care are already operating at capacity or are unavailable. As such, the success of an acute, non-urgent telephone service in achieving its goal of reducing ED presentations and providing timely access to appropriate care may be contingent on investment in primary care or OOH services to ensure adequate capacity to accommodate additional consultations.[54]

Complexities in estimating the costs associated with establishing and running an acute, non-urgent telephone service were highlighted in the results. These include a lack of robust data about resource use, set-up and ongoing running costs of the service, software costs, and measurable health outcomes for callers to acute, non-urgent telephone services. Difficulty in capturing and disaggregating activity data for service users creates a barrier to cost-effectiveness analysis.[135] The findings show that in countries like England, where acute, non-urgent telephone services were upgraded, and existing infrastructures and locations were used, there is a difficulty in calculating initial set-up costs. Furthermore, changes in service delivery, financing models in a new service, and costs involved in decommissioning an old service limit comparability against a brand new service.

3.6.3 Strengths & limitations

There are several strengths and limitations to this scoping review. A comprehensive search strategy was employed and all study designs were included. An extensive search of supplementary and grey literature resources was conducted with a particular emphasis on the following websites for OECD countries: professional bodies, departments of health, ambulance service websites, and HTA agencies. This ensured a wide range of relevant studies were identified.

A key limitation was that it was not possible to pool outcome data, as the acute, non-urgent telephone service models and outcomes assessed differed substantially across countries and studies. Where possible, a narrative commentary has been provided on patterns across studies reporting the same outcomes. Another limitation is that while every effort was made to provide a comprehensive overview of the acute, non-urgent telephone services considered in this scoping review, and the wider healthcare systems within which these services operate, it is not possible to capture all the contextual information that is needed to fully understand both the service and each country's healthcare system. This lack of contextual information leads to difficulties when considering the outcomes of interest considered by each country. Finally, as this is a scoping review aiming to provide an overview of a diverse range of outcomes and practice, no formal quality appraisal of the studies was undertaken.

3.6.4 Conclusion

The available options to access healthcare for acute, non-urgent medical care needs in the pre-hospital setting can vary among countries and regions. Hence, it is important to describe practice and systems that are relevant to the Irish context. Taken as a whole, the available evidence does not provide definitive answers to questions about the optimal design of an acute, non-urgent telephone service, the

effectiveness of the service, and the impact on health outcomes and healthcare delivery. Given differences among countries in how the acute, non-urgent telephone service has been implemented and variation in the outcomes considered, as well as differences in the existing healthcare systems in which the telephone service has been implemented, the maturity of the telephone service, the level of analysis conducted, and the outcomes considered for analysis, it is not possible to draw conclusions on patterns across countries and studies. While acute, non-urgent telephone services can, and do, positively assist callers at an individual level to access timely assistance and appropriate care, the evidence is mixed regarding their impact on broader system-level outcomes. In particular, the evidence did not clearly demonstrate whether a telephone service leads to reductions in ED presentations. Moreover, there was conflicting evidence of the impact of a telephone service on ambulance and primary care utilisation. Our scoping review identified a lack of high-quality, synthesised data on their impact on system performance, resource use, and patient outcomes.

4 Epidemiology and burden of disease

Key points

- The target population for a telephone service in Ireland includes the general population with acute, non-urgent medical care needs, encompassing those who use primary and secondary care services or face barriers to accessing care.
- Demand for healthcare services has increased due to population growth and changing demographics. The population, particularly those aged 65 and older, is projected to increase significantly, further driving this demand.
- Demand for primary care in Ireland is increasing, driven by factors including population growth and an ageing demographic. In addition, broader health reforms such as Sláintecare are contributing to shifts in how and where care is accessed. While Sláintecare aims to reduce pressure on hospital services by strengthening primary care, this transition may lead to increased demand in primary care.
  - Healthy Ireland Survey data indicate that 76% of the population reported visiting a GP in 2023, an increase from 73% in 2019. Given significant projected increases in demand for GP care by 2030, it is predicted that the GP workforce will be insufficient to meet the needs of an expanding and ageing population.
  - The demand for pharmacy services is increasing. In 2024, an Irish Pharmacy Union survey showed that 22% of the public respondents reported using a consultation area in a pharmacy, compared with 15% in 2023.
- The demand for GP out-of-hours (OOH) services is significant, with 1.1 million contacts in 2023 across 17 GP OOH services participating in the HSE grant-funded cooperative schemes, averaging 21,500 contacts per week. This represented an increase of 19% in annual contacts since 2014.
- The Emergency Call Answering Service reported a 35% increase in the volume of calls received requesting emergency services from 2017 to 2023, with a 67% increase in the number of connected calls for emergency ambulance services over the same period.

  - Demand for National Ambulance Service emergency ambulances in Ireland increased by 23% from 2017 to 2022, with 384,000 calls in 2022. The number of medical incidents requiring ambulance dispatch also increased over the same period from 228,000 medical incidents in 2017 to 293,000 in 2022, an increase of 29%.
  - Demand for Dublin Fire Brigade ambulance services increased by 12.1% from 2014 to 2023, with 80,916 incidents in 2023. In 2023, low-acuity calls constituted approximately 20% of these incidents, with more than one fifth of these not requiring hospital transfer.

- Emergency department (ED) attendances in publicly-funded hospitals in Ireland increased by 21.4% from 2016 to 2023, reaching 1.48 million, with higher utilisation among young children and older adults. The Irish Children's Triage System and Manchester Triage System, used to prioritise patients, showed that from 2022 to 2024, 23% of presentations were classified as 'Standard' or 'Non-Urgent.' These lower-acuity cases, which often do not require hospital admission, highlight the potential for managing many of these patients in other, more appropriate, healthcare settings.
- OECD data show that rates of GP and ED visits in Ireland are broadly similar to the OECD average. Additionally, international studies indicate that 13.5% to 40.0% of ED attendances are potentially inappropriate, similar to findings in Ireland.
- The available sources to describe the epidemiology are reliant on self-reported data and surveys, while others may exclude data in relation to patients who pay out of pocket or attend private healthcare facilities.
- The target population for an acute, non-urgent telephone service in Ireland is diverse. While the service is likely to attract users from existing public healthcare options, it may also appeal to individuals who previously faced barriers to accessing healthcare. The projected annual demand for an acute, non-urgent telephone service is between approximately 270,000 to 960,000 calls. The wide range reflects the uncertainty in relation to the data underpinning the estimates. The intention is to provide an indicative range of potential demand to inform budget impact estimates.

4.1 Introduction

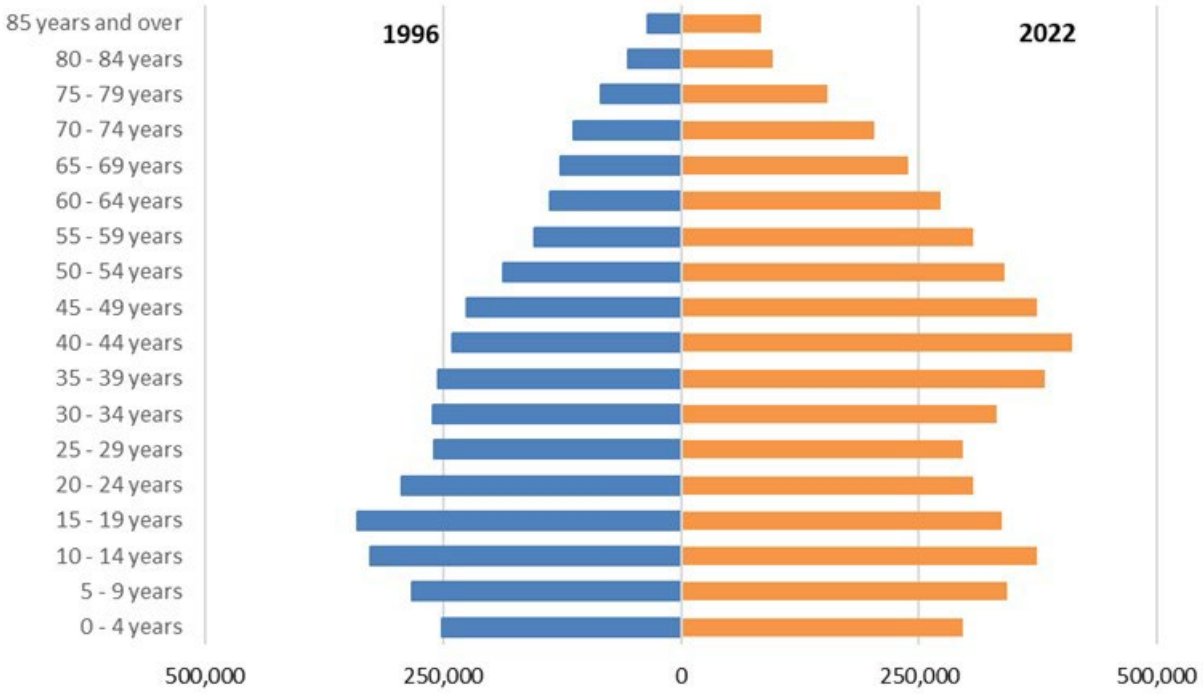
This chapter provides a comprehensive description of the current and projected demand and burden on existing pathways for acute, non-urgent care in the pre-hospital setting in Ireland. This chapter was informed by a review of national and international literature and data. A review of publicly-funded healthcare services in Ireland is described in Chapter 2 of this HTA.

4.2 Target population

The target population for a telephone service is the general population with acute, non-urgent healthcare needs. This will comprise people who currently address their healthcare needs through primary care (general practitioners (GPs), GP out-of-hours services, pharmacy), secondary care (emergency departments (EDs)), or possibly do not seek care because of cost or other barriers to accessing it. The drivers of healthcare demand can include population size, age distribution of the population, health status, individual and national income, technological advancements, and health system characteristics.[198, 199] While the total demand for healthcare services is influenced by population size, the structure of the population also plays a significant role. Demand for healthcare tends to be higher during infancy, old age and, in women, during maternity years.[199]

Results from Census 2022 show that the State's population increased by 387,000 (+8%) since Census 2016, increasing from 4.76 million to 5.14 million.[200] In the general population, 15.1% of people are aged 65 years and older.[200] Between 2002 and 2022, the population aged 65 years and over grew by 36%.[200] Figure 4.1 illustrates the changes in the population's age structure between 1996 and 2022. While there has been rapid population growth, the consequence of the ageing population is that the proportions of people in the 0 to 14 and 15 to 44 age groups have declined, while those in the 45 to 64 and 65 and older age groups have increased. The population of older individuals, aged 65 years and older, is projected to increase substantially, from 781,400 persons in 2022 to 1.4 million by 2042. The significant increase in older age groups, reflecting extended life expectancy, will particularly drive demand for care services required by older people. The demand for healthcare is projected to increase across all healthcare sectors in the years to 2030 due to population growth.[198]

Figure 4.1 Irish population distribution in 1996 and 2022



Source: Central Statistics Office, census data 1996 to 2022.

4.3 Demand for primary care

Primary care services considered in this section include patient consultations with GPs and practice nurses, and consultations with community pharmacists. This section summarises available data regarding current and projected interactions with these services in addition to workforce estimates.

There is no national database of GP consultations in Ireland. Given this, and the nature of practice in Ireland with GPs operating independently, obtaining information on the volume of GP consultations is challenging.[201] The Healthy Ireland Survey involves a sample of approximately 7,500 individuals representative of the population aged 15 and older. The 2023 Healthy Ireland Survey reports 76% of participants visited a GP in the previous 12 months with an average of 4.0 visits per person. Among medical cardholders, 85% of those with a full medical card visited a GP compared with 80% of those with a GP visit card only, with an average of 5.8 and 3.8 visits, respectively. The survey reported that 72% of private patients visited a GP with an average of 3.1 visits.[202] Compared to the 2019 survey, private patients showed an increased visit rate to GPs in terms of both the proportion visiting a GP and the frequency of visits (in 2019, 67% of private patients visited a GP with an average of 3.0 visits). The proportion of those with a medical card or GP visit card visiting a GP remained unchanged from 2019. This survey included

questions relating to children of the survey respondent; 55% of children visited a GP in the past 12 months, with an average of 2.4 visits per child. For children aged under six years, 76% visited a GP with an average of 4.0 visits per child. Additionally, 64% of children's GP visits were reported as free of charge.[202] Although the Healthy Ireland Surveys provide some indication of frequency of attendances, they do not give information on the nature of attendances — for example, if visits related to routine attendances (such as chronic disease management, immunisations, and antenatal check-ups) or attendances related to acute episodes. A survey to ICGP members in 2020 estimated that 21 million GP consultations occur in Ireland annually, with an Irish person visiting their GP an estimated 4.3 times a year.[5] This finding is consistent with the visit rates reported from the Healthy Ireland Survey.[202]

The Healthy Ireland Survey also provides data with respect to nurse-only consultations. The 2023 survey reported that within GP practices, 37% of individuals had nurse-only consultations (excluding visits where they also consulted a GP). Nurse-only consultations have increased steadily since 2015, when 30% reported having a nurse consultation. Among individuals with a full medical card, 51% reported consulting a nurse, averaging 0.3 consultations. Similarly, those with a GP visit card (48%) reported an average of 0.4 nurse consultations. In contrast, 29% of private patients reported a nurse consultation, with an average of 0.5 visits. Older individuals were more likely to visit a nurse than younger cohorts, with 56% of those aged 75 years and older reporting that they had visited a nurse in a GP practice compared with 26% of 15- to 24-year-olds.[202] A 2020 ICGP survey estimated that there are approximately 7.7 million practice nurse consultations in Ireland annually.[5] It should be noted that, in contrast to the Healthy Ireland data, the ICGP figure also included nurse consultations that coincided with a GP consultation.

In 2021, Ireland had a higher-than-average number of doctors per head of population when compared with Organisation of Economic Co-operation and Development (OECD) countries. GPs represented 21% of all physicians in Ireland in 2021, compared with an average of 23% across OECD countries.[203] According to the Medical Workforce Intelligence Report by the Irish Medical Council, 4,525 clinically-active doctors on the Council's register self-reported their employment role as being a GP in 2023.[204] However, this workforce capacity must be considered in the context of projected increasing demand on healthcare sectors, and in particular on primary care. A report by the ICGP in 2022 on the Workforce and Workload Crisis in General Practice in Ireland stated that the number of GPs is insufficient to meet the needs of an expanding and ageing population with complex care requirements. A 2017 report by the ESRI projected that demand for GP visits would increase by up to

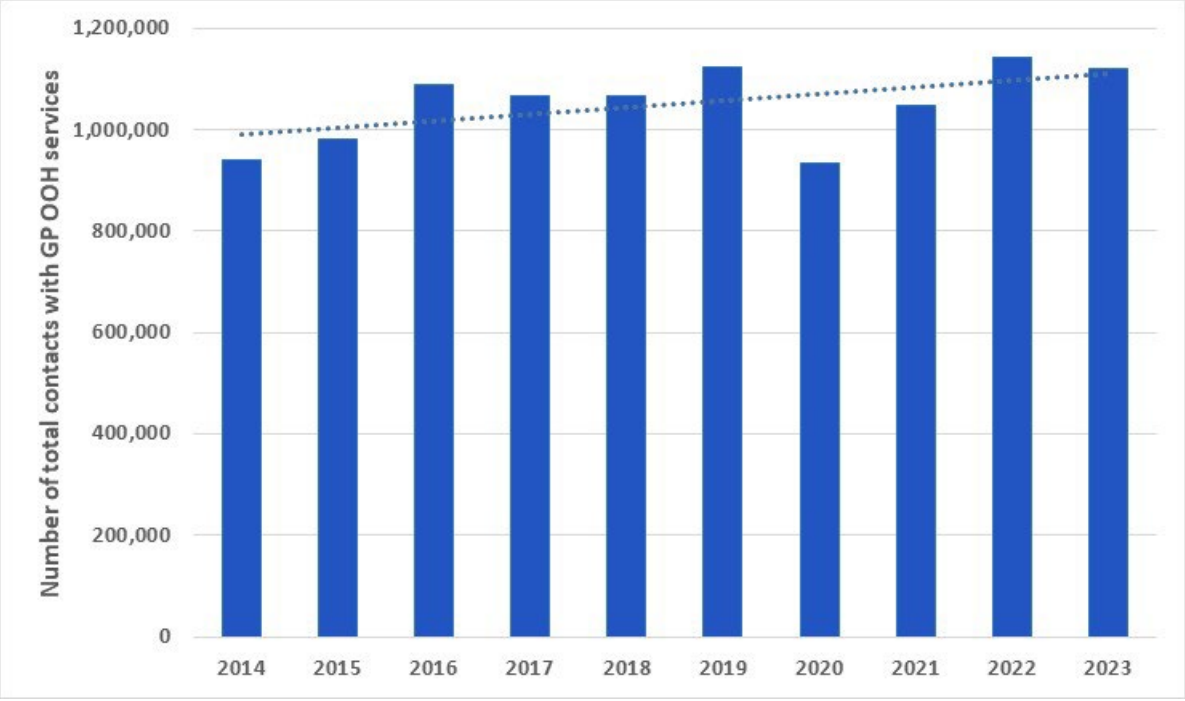
27% from 2015 to 2030.[205] Similarly, a 2018 healthcare capacity review by the Department of Health estimated that the primary care GP workforce needed to increase by 39% by 2031 to meet rising demand and requirements relating to reform of health services.[206, 207] Accurately projecting demand and capacity is challenging due to a combination of changing demography, patterns of healthcare utilisation, and limited information on the working patterns and availability of GPs. The Sláintecare Report, published in 2017, proposed significant policy reforms which aim to transition the focus of care delivery from a hospital-centric healthcare system to one that places greater emphasis on primary care.[33] Studies in Ireland have observed a rise in GP service demand when fees are reduced or eliminated.[208-210] Recommendations and plans to further expand universal access to free GP and primary care services are therefore expected to further increase demand for GPs and other professionals in the primary care workforce.

In October 2024, there were 1,905 retail pharmacy businesses registered with the Pharmaceutical Society of Ireland (PSI), with 5,256 registered pharmacists reporting that they work in community pharmacy.[11] The Irish Pharmacy Union has commissioned annual Public Attitudes Towards Pharmacy surveys which are based on a nationally-representative sample of 2,000 members of the public. In the 2024 survey, 51% of respondents reported visiting a pharmacy in the past week; 22% reported using the consultation area in a pharmacy within the past month, compared with 15% in the 2023 survey. Additionally, 41% of respondents reported using the consultation service within the past six months.[211] It is noted that while a significant number of the population may visit a pharmacy each year for advice, not all these consultations occur in a dedicated consultation area. As the survey is limited to use of the consultation area, it likely underestimates the proportion of the population using pharmacy services for advice. Demand for pharmacy services for the Primary Care Reimbursement Scheme for prescription pharmaceuticals in Ireland was predicted to increase by between 34% and 37% from 2015 to 2030.[198] This increase in consultations is consistent with ESRI projections that requirements for pharmacy consultations would rise by up to 25% from 2015 to 2030.[198] In 2023, the Minister for Health launched an Expert Taskforce to support the expansion of the role of pharmacists. The objectives include expanding the scope of practice pharmacists, reducing the workload for GPs, and improving access for patients.[212] According to the 2023 PSI Workforce Survey of registered pharmacists and fifth-year pharmacy students, 57% of community respondents do not believe that pharmacy services are sufficiently staffed; however, these results should be interpreted with caution given the low response rate of 18%.[213]

4.4 Demand for out-of-hours primary care

In 2023, there were 1.1 million GP OOH contacts across 17 GP OOH services participating in the HSE grant-funded cooperative schemes across the nine Community Health Organisations (CHOs). This represented an increase of 19.3% in annual contacts since 2014 (Figure 4.2).[214] In 2023, 14% of contacts to OOH services required an onward referral to an ED. From 2014 to 2023, excluding the years impacted by the COVID-19 pandemic (2020, 2021 and 2022), the HSE reported 70.8% (range: 65.1% to 73.3%) of contacts with OOH services were assessed by a GP.[214] This figure includes those seen by a GP in the treatment centre, by a GP home visit, and GP consultations conducted over the phone. Disaggregated data on the volume of phone consultations are not available. There are no data available on the dispositions of individuals who contacted the GP OOH services but who were not assessed by a GP. These individuals may have chosen to call an ambulance, go to an ED, wait for an in-hours GP appointment, or opted for self-care.

Figure 4.2 Number of contacts with GP out-of-hours services 2014–2023



Note: Trend line represents linear regression.

Data from the GP OOH services participating in the HSE grant-funded cooperative schemes include both medical card and non-medical card holders. However, it is

noted that there are other providers of GP OOH services, both in-person and online, data for which are not included in these estimates. In 2024, Southdoc, serving the Cork and Kerry regions, handled over 200,000 patient contacts. Of these, more than 56% were managed at a treatment centre, 27% involved a doctor consultation by phone, 12.4% concluded with nurse advice, and 3.8% resulted in a home visit. Separately, of the 200,000 contacts, 11.4% were referred to an ED. The majority of contacts to Southdoc in 2024 were from medical card patients, accounting for 71%, while the remaining 29% were private patients.[215] Another source of GP OOH service data is the Healthy Ireland Survey. In 2023, 9% of respondents reported using a GP OOH service in the previous 12 months; no data are collected in relation to those who may have used the service on multiple occasions.[202]

4.5 Demand on the 112/999 phone line for emergency ambulance services

Emergency services considered in this section include the Emergency Call Answering Service (ECAS), the National Ambulance Service (NAS) and the Dublin Fire Brigade (DFB). ECAS is responsible for answering all 112 and 999 calls, SMS messages and eCalls. ECAS determines the location of the caller in order to route the call to the most appropriate control centre for that emergency service. For emergency ambulance calls, ECAS connects the call to either NAS or DFB. This section summarises available data regarding current demand on these services.

4.5.1 Emergency Call Answering Service

In 2023, ECAS received over 1 million calls requesting emergency services, representing an increase of approximately 35% since 2017 (Table 4.1). In 2023, the majority of calls forwarded to the emergency services were connected to ambulance services (NAS and DFB) (47%), followed closely by An Garda Síochána (46%). The Fire Services accounted for 6% of calls received in 2023 and the Coast Guard for 1%.[216] The proportion of calls connected to ambulance services increased from 37.9% (approx. 298,000 calls) in 2017 to 47.0% (approx. 499,000 calls) in 2023 (Table 4.1).[216-221] This represents a 67% increase in the annual number of connected calls to ambulance services over this time period, highlighting a disproportionate increase in demand relative to other emergency services.

Table 4.1 Emergency Call Answering Service (ECAS) annual call volume 2017–2022

Year	Connected calls# (n)	Calls connected to Ambulance Service (%)
2017	786,531	37.9
2018	841,417	40.3
2019*	852,888	42.5
2020*	823,871	43.4
2021*	905,925	47.5
2022*	1,019,126	47.8
2023*	1,063,522	47.0

Key: *Total call volumes included eCalls since 2019. An eCall is an emergency call that is triggered either manually, by vehicle occupants, or automatically as soon as an in-vehicle sensor detects an impact from a serious collision.
#Connected calls exclude noisy and silent calls.

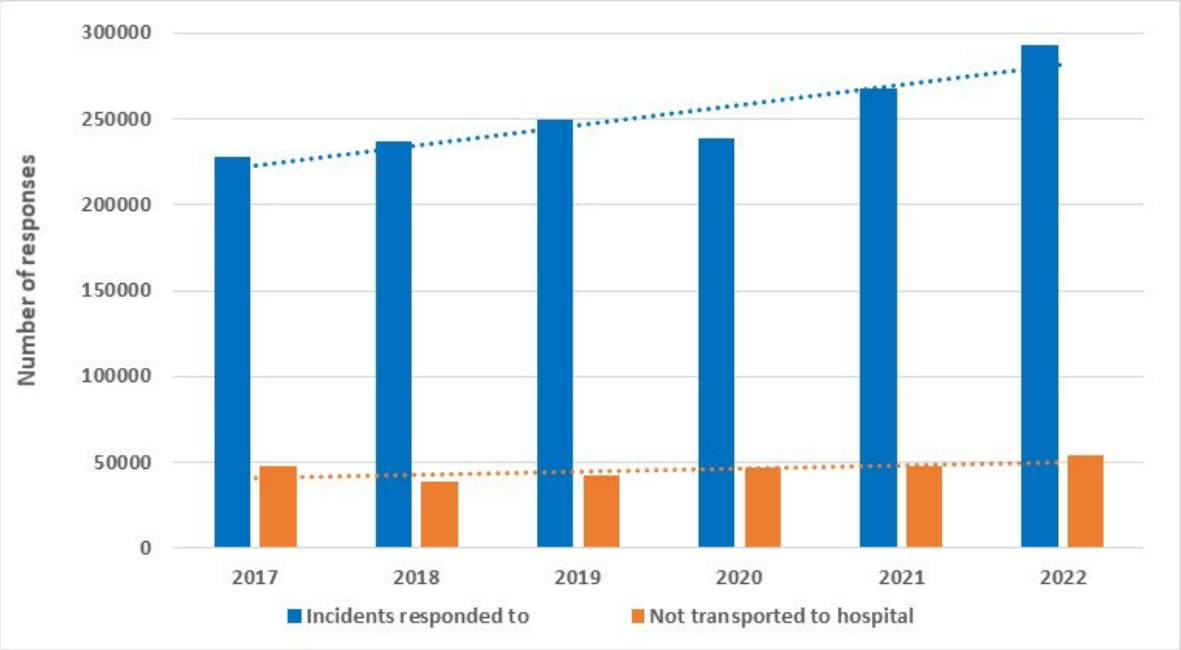
4.5.2 Demand on the National Ambulance Service

Data from the annual HSE National Service Plans related to the NAS highlight that demand for emergency ambulances has increased substantially in Ireland, from 312,000 calls in 2017 to 384,000 calls in 2022, an increase of 23%.[222, 223] The number of unique medical incidents to which NAS responded (after exclusion of hoax calls and multiple calls for the same incident) also increased over this time frame from 228,000 medical incidents in 2017 to 293,000 in 2022, an increase of 29%.[224] With the exception of 2020, there has been a year-on-year increase in the number of medical incidents to which NAS has responded between 2017 and 2022; differences in 2020 may be attributable to the COVID-19 pandemic. While acknowledging this trend of increasing absolute numbers of medical incidents, it is noted that the overall population has grown from 4.81 million to 5.14 million over this same time period.[225, 226] This increased demand for emergency ambulances has also been observed in international literature.[227, 228]

From 2017 to 2022, 18.2% (range: 16.2% to 20.8%) of medical incidents to which NAS responded did not result in hospital transfer (Figure 4.3).[224] Of note, all patients attended by an ambulance must be transported to hospital unless they decline transport and have the capacity to make that decision.[229] Where an individual has died at the scene, An Garda Síochána are informed and are

responsible for requesting the attendance of a medical practitioner. The body is not transported in an ambulance unless there are extenuating circumstances.[230] As outlined in Chapter 2, NAS provides See and Treat and Hear and Treat services for some low-acuity calls. Between August 2022 and July 2023, NAS's See and Treat service provided medical care for 8,031 low-acuity calls. Of these, 54.1% were assessed by NAS paramedics at the individual's location, followed by appropriate immediate treatment without transfer to hospital.[224] Assessments can conclude with discharge from care or referral for further assessment or treatment. Between August 2022 and July 2023, Hear and Treat clinical staff managed 25,372 low-acuity calls. Of these, one third received clinical advice or were referred to non-emergency services, potentially avoiding 8,326 unnecessary emergency ambulance dispatches and ED transports.[224]

Figure 4.3 Number of incidents responded to by the National Ambulance Service between 2017 and 2022.



Source: National Ambulance Service.
Note: Trend lines represents linear regression.

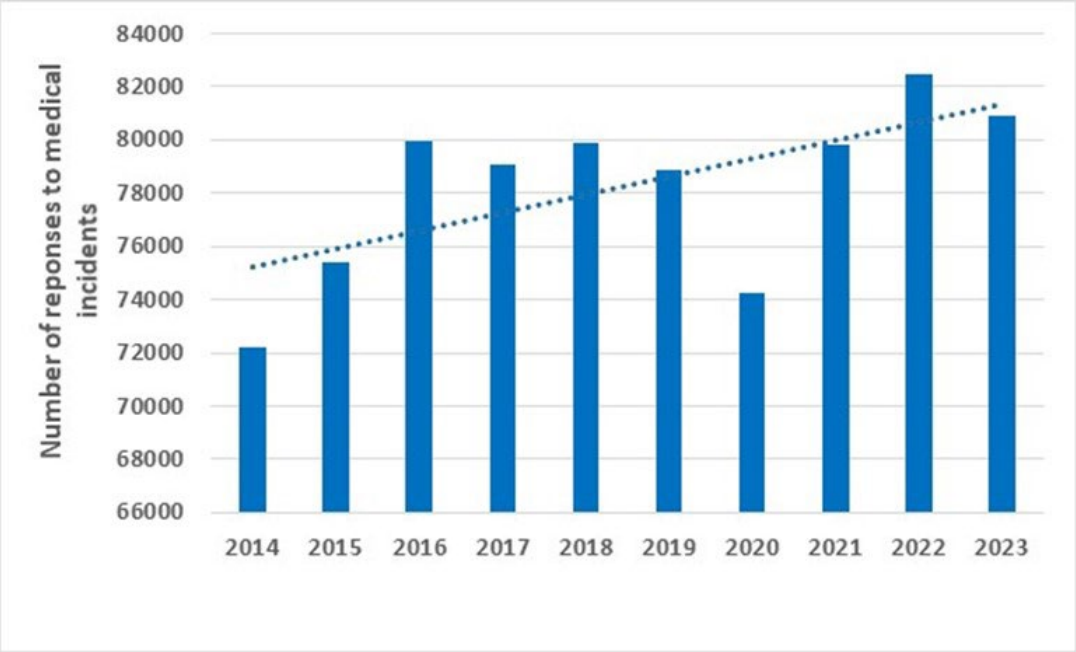
Fifty per cent of those attended by NAS are aged 65 years and older.[32] This is disproportionate to their share of the population — as highlighted in Section 4.2, census data indicate that individuals aged 65 years and older comprise 15.1% of the total population. This finding is consistent with international literature that older adults are more likely to require ambulance services.[231] Given the census

projections of increases in the proportion of the population aged 65 years and older, this will contribute to further increases in requirements for ambulance services.

4.5.3 Demand on the Dublin Fire Brigade for emergency ambulance services

The Dublin Fire Brigade (DFB) provides emergency ambulance services for Dublin City and County in response to calls routed from ECAS. The number of calls for ambulance services to which DFB responds has increased over the past ten years. In 2014, there were ambulance responses to 72,186 incidents, growing to 80,916 responses in 2023, representing a 12.1% increase (Figure 4.4).[232] The inter-agency agreement between DFB and NAS has been in place since 2017, through which both organisations cooperate to optimise use of combined available resources. In 2022, while DFB requested resources from NAS on over 63,000 occasions, NAS indicated they could not provide a resource for 76% of these requests. This number increased to over 66,000 requests in 2023, with NAS unable to fulfil 70% of them. From 1 January to 30 September 2024, DFB made 52,872 resource requests to NAS, which could not provide a resource for 64% of these requests.[233] These requests spanned all acuity levels. When NAS cannot provide a resource, the call is queued with DFB until a resource becomes available. These figures suggest the combined resources of NAS and DFB cannot meet current ambulance demand in Dublin City and County.[234]

Figure 4.4 Number of ambulance incidents responded to by Dublin Fire Brigade 2014–2023.

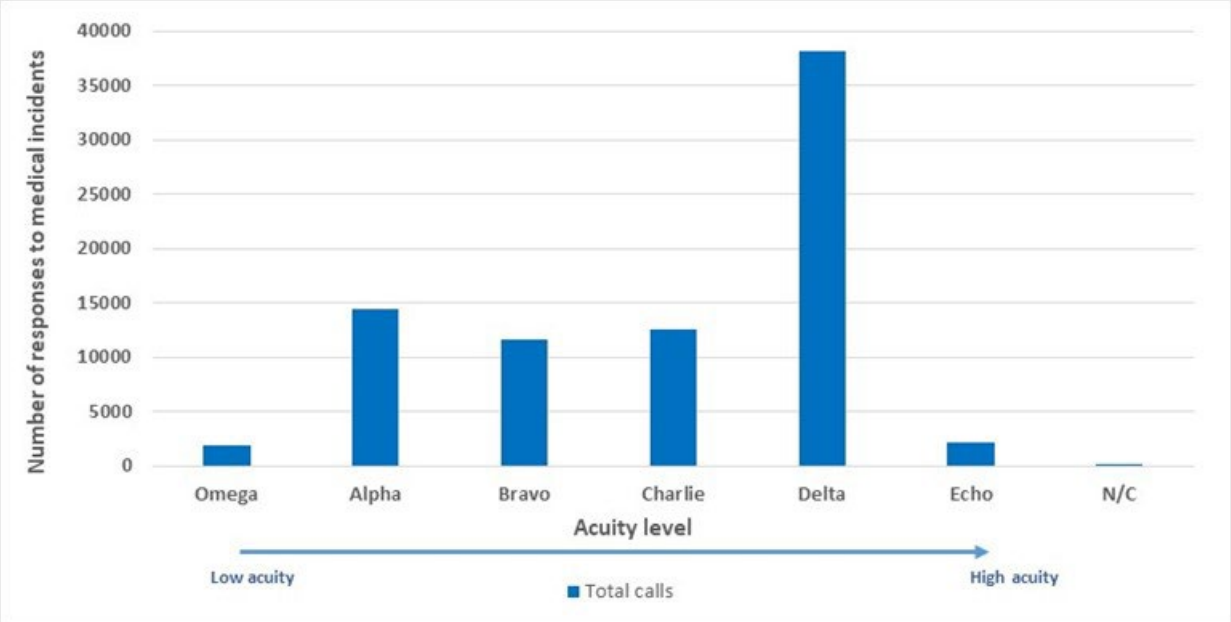


Source: Dublin Fire Brigade Ambulance Incident Activity, Dublin City Council.[232]
Note: Trend line represents linear regression.

As highlighted in Chapter 2, calls received by DFB are categorised as one of six acuity levels, ranging from those categorised as minor illness or injury (Omega and Alpha) to those categorised as being life threatening (Delta and Echo). While the proportion of low-acuity Omega calls steadily decreased from 5.2% in 2014 to 2.5% in 2023, over the same time period, on average, 17.7% (range: 15.0% to 19.4%) of all calls were categorised as Alpha calls. DFB engage with NAS to utilise alternative pathways in which low-acuity calls are transferred to the NEOC clinical hub. The 2017 inter-agency agreement may have contributed to the decline in Omega incidents over time.

Considering specifically data from 2023, the DFB reported that 49.7% of all calls were categorised as relating to life-threatening incidents (Delta or Echo); 30.0% were categorised as serious, requiring urgent or immediate care (Bravo or Charlie); while 17.8% and 2.4% of calls were low-acuity Alpha and Omega calls, respectively. Alpha and Omega calls accounted for over 16,000 ambulance calls in 2023; of these, 22.3% were not transferred to hospital.[233] Classification options for cases not transported to hospital include that the patient declined transport, case gone on arrival of the ambulance, case stood down or case cancelled.[233]

Figure 4.5 Number of Dublin Fire Brigade ambulance calls by level of acuity in 2023



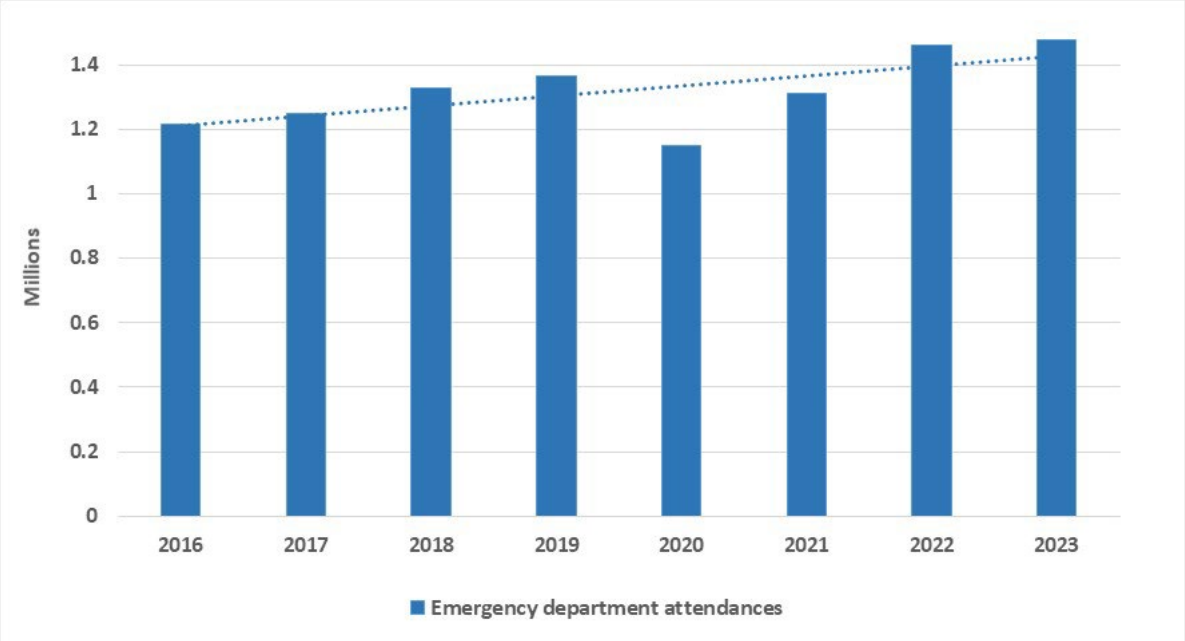
Source: Dublin Fire Brigade Ambulance Incident Activity, Dublin City Council.[232]
Key: Omega – non-serious or life threatening/minor illness or injury; Alpha – non-serious or life threatening; Bravo – serious not life threatening/urgent; Charlie – serious not life threatening/immediate; Delta – life threatening/other than cardiac or respiratory arrest; Echo – life threatening/cardiac or respiratory arrest; N/C – not categorised.

4.6 Demand on hospital emergency departments

In the 2023 Healthy Ireland Survey, which includes a nationally representative sample aged 15 years and older, 16% of respondents reported using an ED in the past 12 months; 13% reported using an ED in a public hospital, while 3% reported using this service in a private hospital. This represents an increase from the 2018 survey where 13% of respondents reported using an ED (11% used EDs in public hospitals and 2% used EDs in private hospitals).[202] There are no centrally-reported data relating to ED attendances at private facilities.

The HSE Patient Experience Time (PET) dataset reports patient-level data across all 30 publicly-funded EDs. The data collected provides information on each presentation including age, gender, mode of arrival, referral type, acuity and whether a patient was admitted to hospital.[235] The Irish Children's Triage System (aged 15 years and younger) and Manchester Triage System (aged 16 years and older) are used in EDs in Ireland to determine the clinical priority of individuals based on their presenting symptoms. It does not rely on diagnosis, but assigns urgency levels for first medical assessment. There are five categories of increasing priority: non-urgent, standard, urgent, very urgent and immediate. The triage score also has associated clinical targets for the maximum waiting time these cohorts should have to wait prior to being seen by a clinician. HSE PET data indicate that ED attendances in publicly-funded hospitals increased by 21.4% from 1.22 million in 2016 to 1.48 million in 2023 (Figure 4.6).[236] It is noted that this growth is in the context of a 10.9% growth in the Irish population over the same period.[237, 238] With the exception of 2020 and 2021, a trend for increasing attendances can be seen over time. The altered pattern seen in Ireland in 2020 and 2021 may have been attributable to the COVID-19 pandemic, and mirrors international data. Reasons for decreased attendances at that time were likely to be complex and multifactorial such as public fear of contracting the SARS-CoV-2 virus, changes in healthcare policies, and the impact of lockdowns and social distancing measures.[239-243]

Figure 4.6 Number of emergency department attendances in Ireland 2016–2023



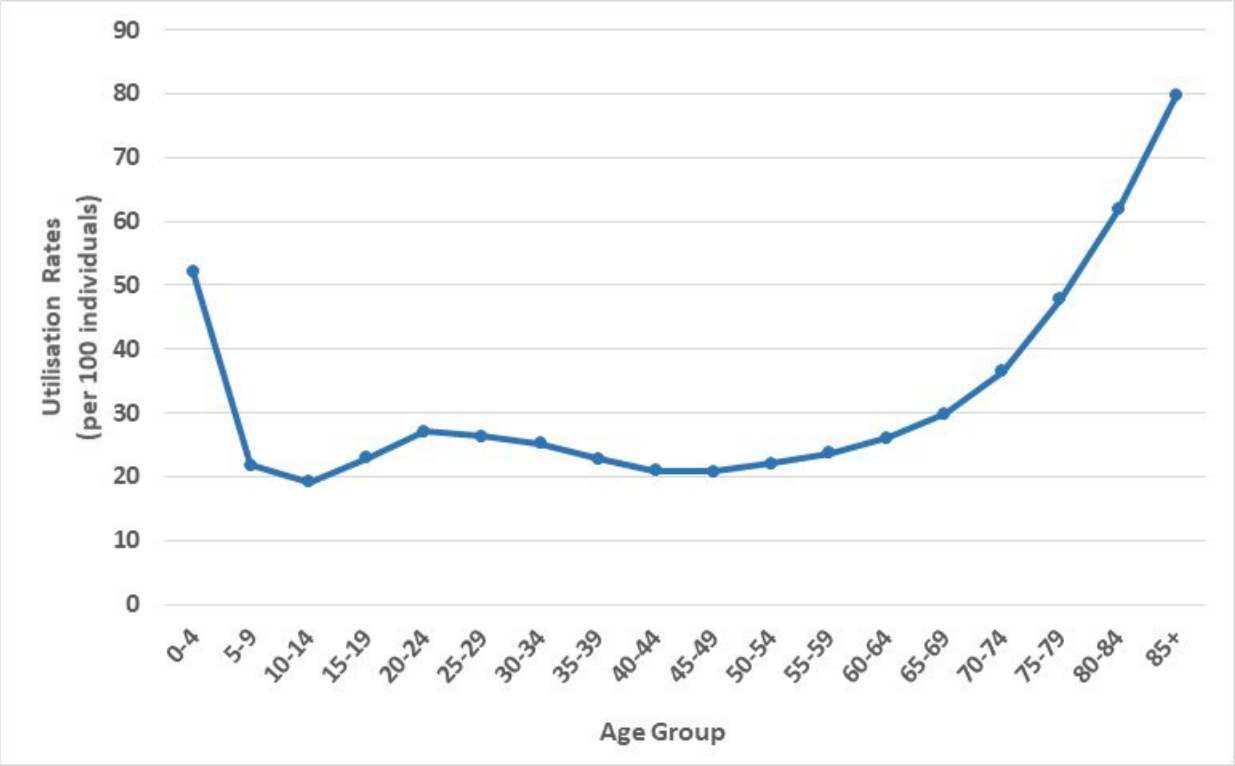
Source: HSE PET database.[236]
Note: Trend line represents linear regression.

The volume and type of ED presentations vary markedly over each 24-hour period and when comparing weekday versus weekend presentations. For example, in 2023, the peak time for presentations was 12 midday, with an eight-fold difference in presentations between this time compared with the nadir at 5am. The number of presentations for low-acuity triage categories markedly increased as regular working hours commenced. The proportion of patients in the non-urgent triage category increased from 1% of presentations at 5am, to a peak of 3% of presentations at 8am. The proportion of patients in the standard triage category increased from 11% at 5am to a peak of 26% at 8am, declining to 15% after 9pm. In 2023, ED presentations were more frequent on weekdays (Monday to Friday), with each of these days accounting for between 15% and 16% of all attendances, compared with weekends, which saw 11% to 12% of presentations. The number of non-urgent presentations was twice as high on weekdays (2%) compared with weekends (1%).

Figure 4.7 shows ED utilisation rates by five-year age bands in the year 2023. The highest utilisation rates are seen for those aged four years and under and for those aged 70 years and older. There were 52 ED visits per 100 individuals for those aged four years and younger. For individuals aged 70 years and older, utilisation increased consistently with age from 36 ED visits per 100 individuals in those aged 70 to 74 years to 80 ED visits per 100 individuals in those aged 85 years and older. These

utilisation rates compare with an average of 19 to 30 ED visits per 100 individuals in those aged between five and 69 years.[236] These figures include individuals with multiple attendances.

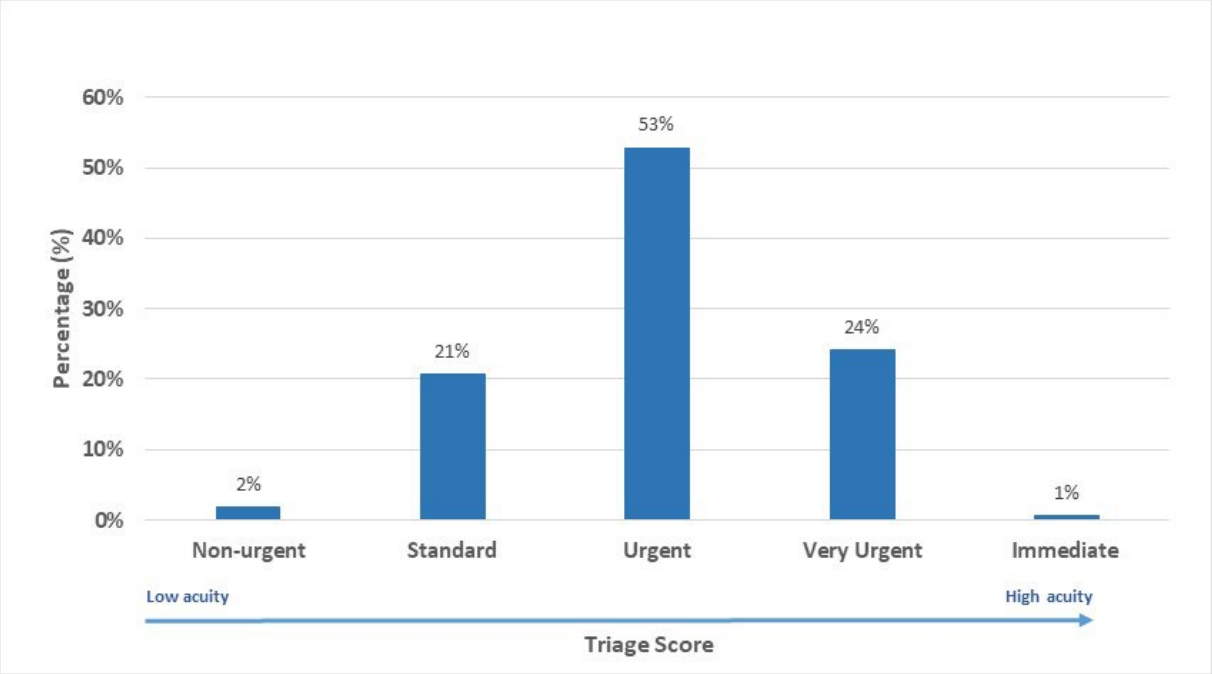
Figure 4.7 Utilisation rates of EDs in 2023 by five-year age bands



Sources: HSE PET database[236] and CSO population estimates 2023.[238]
Note: Data are limited to attendances in ED units in public hospitals only.

PET data indicate that from January 2022 to October 2024, 2% of triaged presentations had a triage score of "non-urgent" (Figure 4.8).

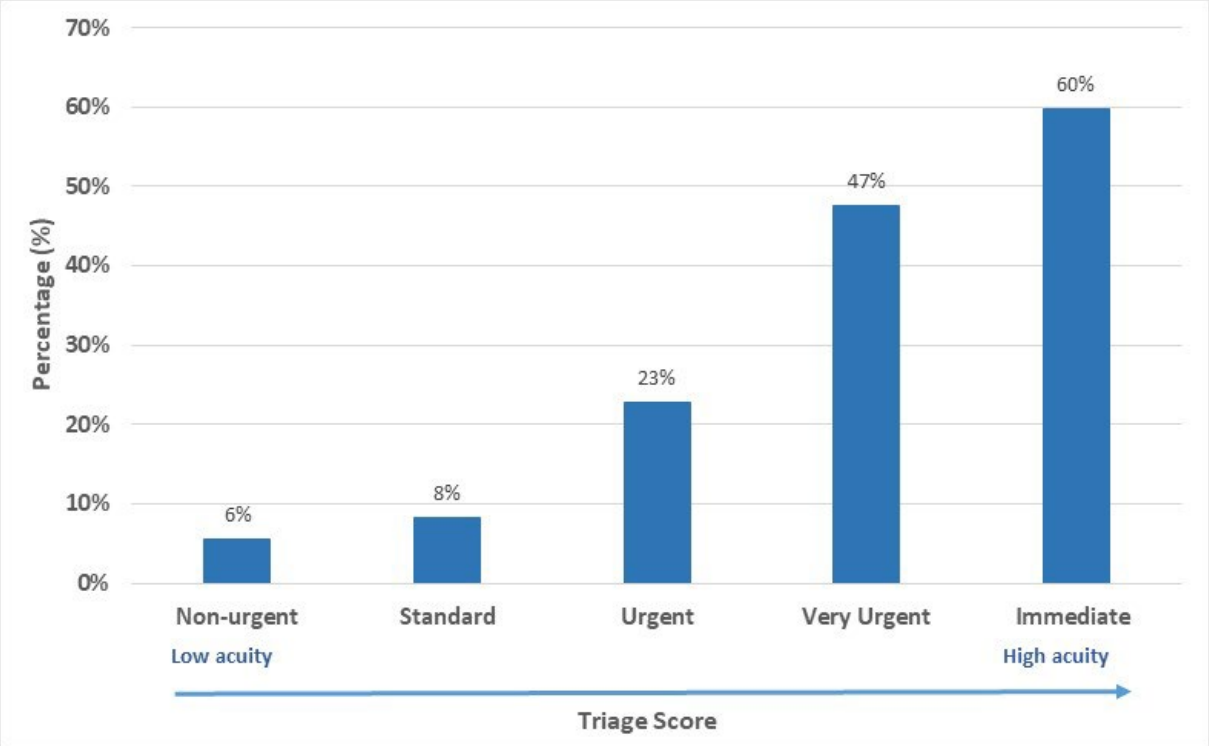
Figure 4.8 Percentage of emergency department presentations by triage score January 2022–October 2024



Source: HSE PET database.[236]
Note: Unspecified presentations were removed for this distribution. From January 2022 to October 2024, there were approximately 520,000 presentations with no triage score assigned out of a total of 4.3 million presentations.

The probability of being admitted to hospital is directly related to the triage score. From January 2022 to October 2024, 6% of those with a triage score of non-urgent and 8% of those with a triage score of standard were admitted to hospital, compared with 23% to 60% of those with higher acuity triage scores (Figure 4.9). These data indicate that there may be potential for individuals with lower acuity scores to be managed within community settings rather than in EDs.

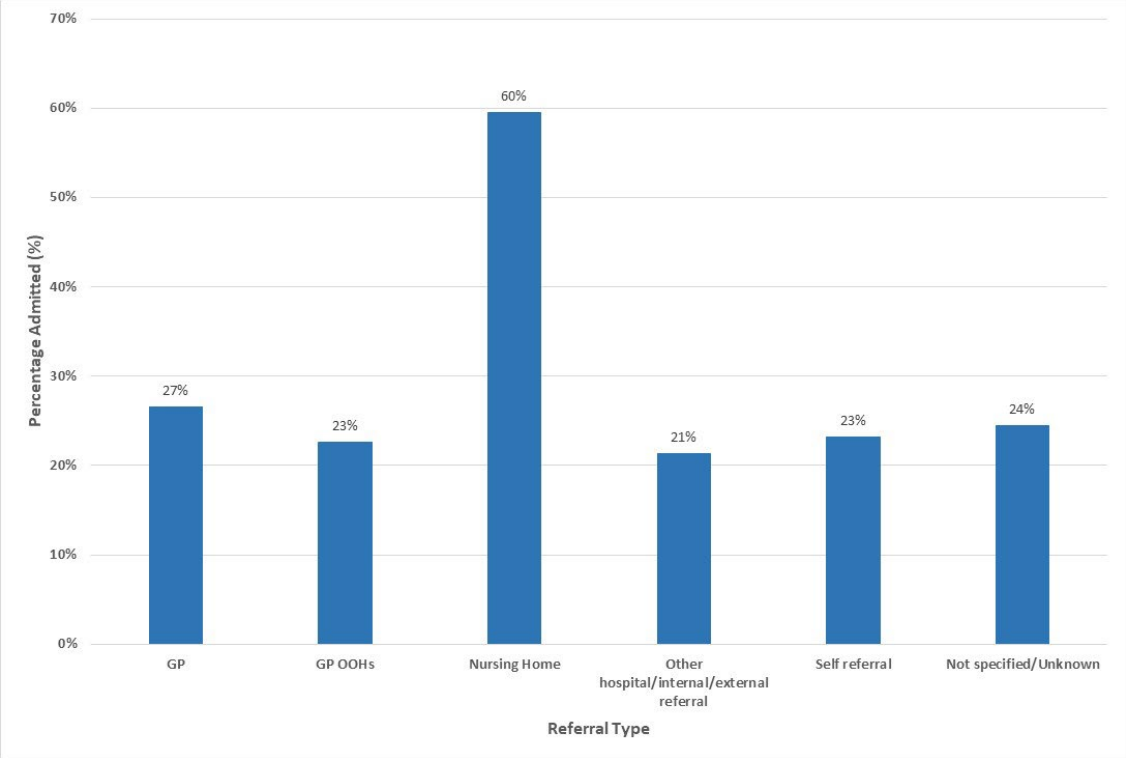
Figure 4.9 Percentage of admissions to ED by triage score January 2022–October 2024



Source: HSE PET database.[236]

Analysis of admission rates based on referral type for the period January 2022 to October 2024 indicates that admission rates were similar for those who self-referred to the ED (23%) and those referred by GP OOH services (23%). Admission rates were highest (60%) in those individuals who were referred from nursing homes (Figure 4.10).[236]

Figure 4.10 Admission rates by referral type January 2022–October 2024



Source: HSE PET database.[236]
Note: The different categories of referral were GP, GP out-of-hours, self, other hospital, nursing home, other internal referral, other external referral, not specified/unknown.

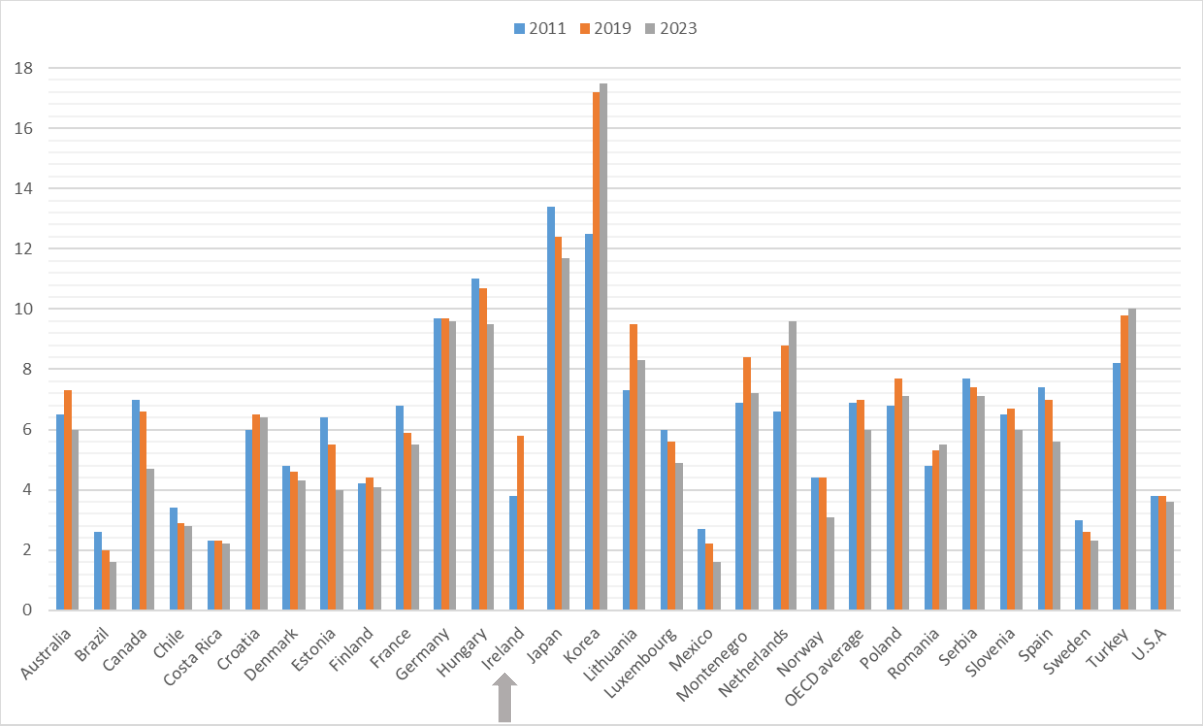
Utilisation of EDs for non-urgent care increases demand for services and can contribute to overcrowding. A 2020 review of five EDs (Midlands Regional Hospital Tullamore (MRHT), University Hospital Limerick (UHL), St. Vincent's University Hospital (SVUH), St. James's University Hospital (SJUH) and University Hospital Kerry (UHK)) in Ireland examined the appropriateness of patient attendances. The study determined that 18% to 35% of lower-acuity presentations were potentially inappropriate and that 11% to 38% of all patient attendances could have been treated by a GP within a time frame of up 48 hours.[244] Patients who attended these five EDs were asked about awareness of alternative pathways for emergency care, namely injury units and OOH GP services. Three of the five hospitals (UHL, SVUH and SJUH) had injury units operating in their region; 2% of those attending the ED in SJUH were aware of injury units compared with 9% of those attending SVUH and 35% of patients attending UHL. On average, 58% of patients were aware of OOH GP services ranging from 40% of those attending SVUH to 90% of those attending MRHT.[245] Nationally, there are regional variations in terms of access to OOH GPs

and injury units which likely influences the utilisation of EDs. Musculoskeletal injuries accounted for 24% of the ED presentations, and nearly one third of patients (31%) visited the ED specifically for an X-ray or scan; these patients' needs may be better served in an injury unit.[245] Improved awareness and provision of alternative care pathways could potentially lead to a reduction in ED attendances. Another noteworthy finding from this study is that 38% of patients reported symptoms lasting more than seven days before their ED visit. While the study did not identify what proportion of these patients self-referred to the ED as opposed to first attending (and possibly being referred by) another service, it is possible that some of these patients could have been potentially managed in primary care.[245]

4.7 International data

Data from the OECD on the number of face-to-face contacts with physicians, including both generalists and specialists, can be used as a broad measure of primary care utilisation. Figure 4.11 displays the mean number of face-to-face contacts for OECD countries with available data. The OECD average was six consultations per person per year. While most countries reported an average of between four and 10 consultations per person per year, data for the most recent year of reporting ranged from fewer than three in Brazil, Chile, Costa Rica, Mexico and Sweden to over 15 in Japan, Korea and Turkey (Figure 4.11).[203] Most OECD countries reported a decline in the mean number of in-person consultations in their most recent survey data. The OECD speculated that this reflects the substantial impact of COVID-19 in terms of disruption to services and people's reluctance to visit healthcare facilities due to concerns about catching the virus. It also likely reflects an increased use of teleconsultations during the pandemic in all countries with available data.[203]

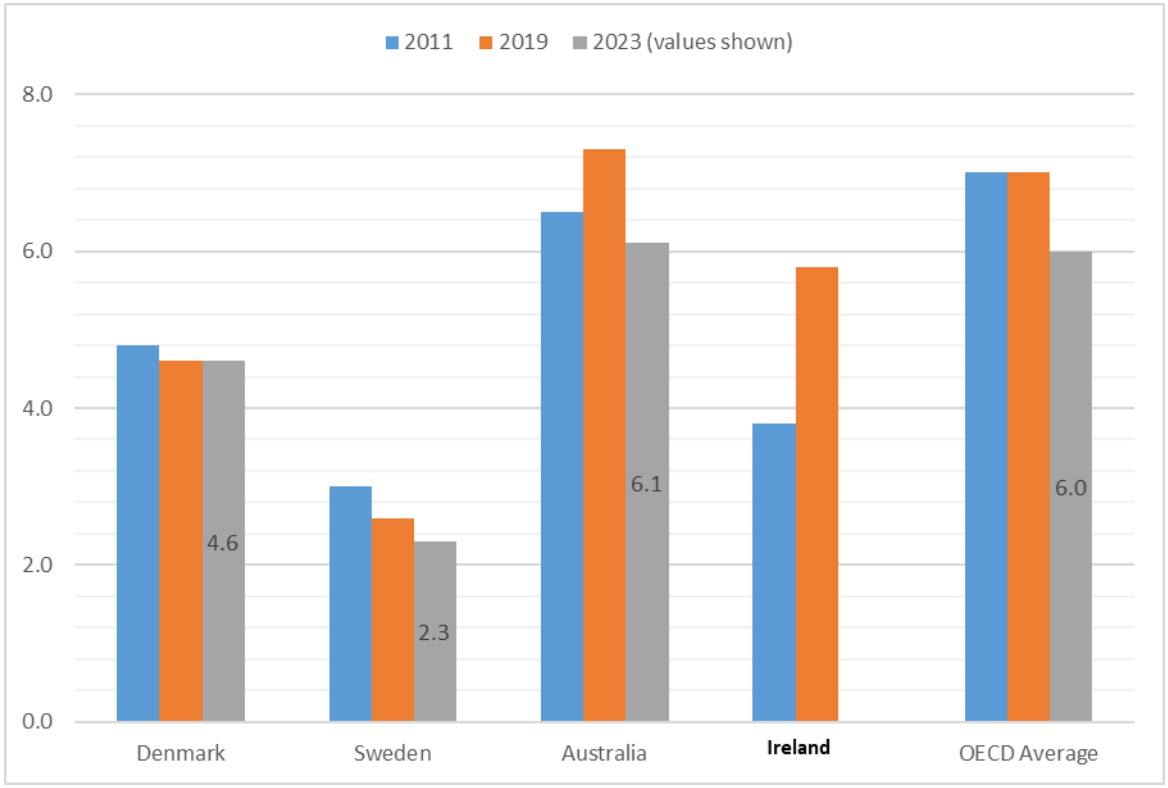
Figure 4.11 Mean number of in-person doctor consultations per person, OECD countries with available data, 2011, 2019 and 2023 (or nearest years)



Source: OECD (2023).

Figure 4.12 presents data from countries considered in depth in Chapter 3 that have implemented an acute, non-urgent telephone service and for which data were available (Denmark, Sweden and Australia). These data are compared with data from Ireland and the OECD average. The figures presented are from 2011, 2019 and 2023 (or nearest years). Of note, the medical help line in the Capital Region of Denmark was established in 2014; a telephone service was implemented across Sweden between 2003 and 2013; the Australian Healthdirect help line was established in 2006. The 2023 data indicate that the mean number of in-person consultations in these countries was at or below the OECD average of 6.0 consultations (ranging from a mean of 2.3 consultations in Sweden to 6.1 consultations in Australia).

Figure 4.12 Mean number of in-person doctor consultations per person, Denmark, Sweden, Australia, Ireland 2011, 2019 and 2023 (or nearest years)



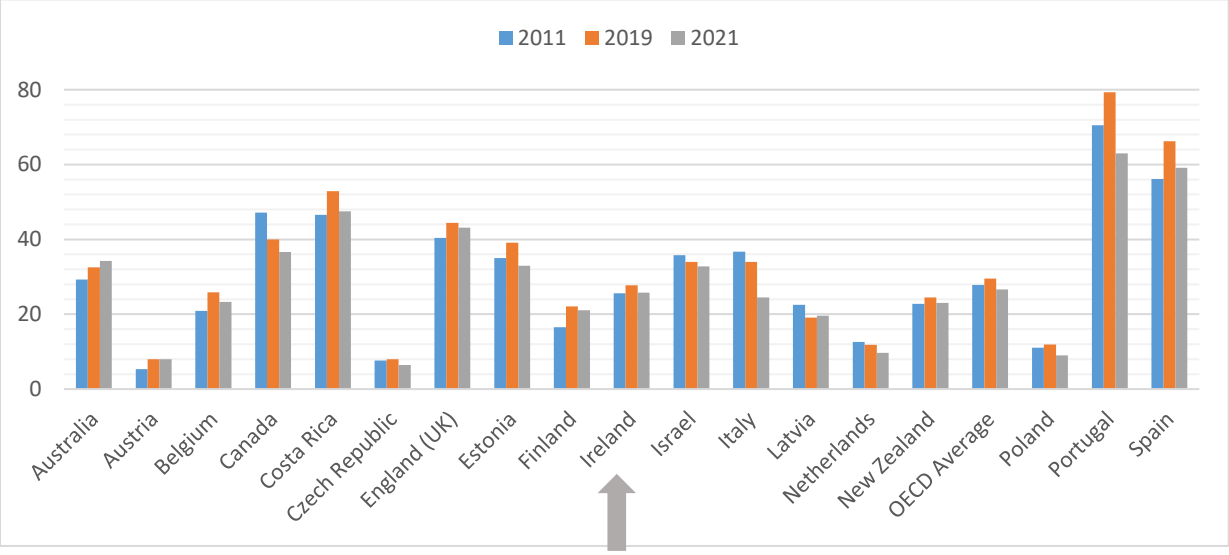
Source: OECD (2023).

The OECD do not report data with respect to OOH primary care services and no other internationally-collated data was identified in this regard. As outlined in Chapter 2, models of OOH service delivery vary greatly across, and often within, countries, with most countries using a mixture of service delivery models (Appendix A provides further details of these services). This limits the potential to compare utilisation data among countries. However, irrespective of the OOH service delivery model, EDs still play an important part in non-urgent or out-of-hours care across all OECD countries.

The most recent OECD data available show that, across countries with available data, there were an average 26.6 ED visits per 100 people annually in 2021. However, there was marked variability across countries, ranging from 6.4 ED visits per 100 people in the Czech Republic to 63 visits per 100 people in Portugal (Figure 4.13).[203] While mean ED visit rates increased in the majority of OECD countries in 2019 compared with 2011, almost all countries reported a decline in their mean ED visit rate in 2021. As with the data for GP consultations (Figure 4.12), this may have reflected the impact of the COVID-19 pandemic. An earlier OECD report indicated

that ED visit rates increased over time in almost all OECD countries between 2001 and 2011. This report highlighted that across countries, ED visits were generally more frequent among the youngest and oldest populations and that injury diagnoses constituted one of the most common reasons for visiting EDs.(194)

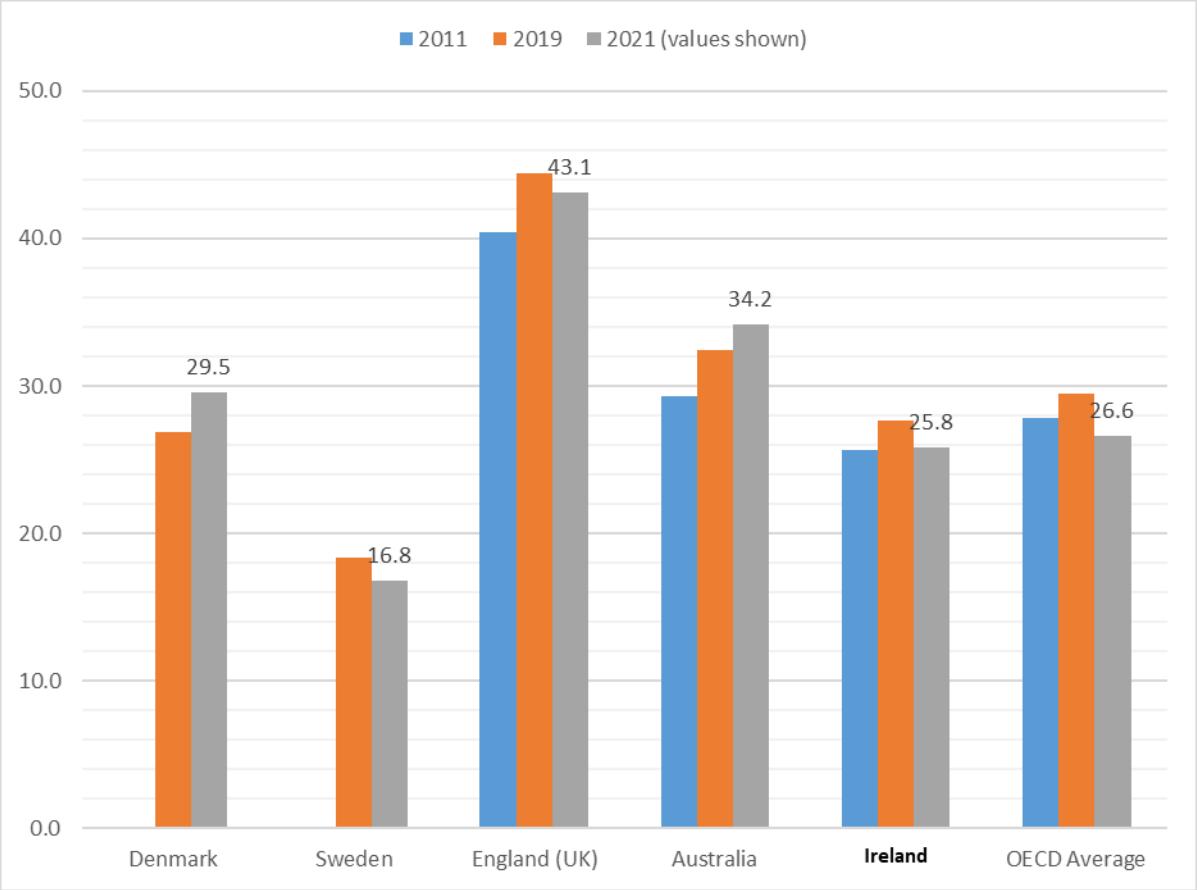
Figure 4.13 Mean number of visits to EDs per 100 population, OECD countries, 2011, 2019 and 2021 (or nearest years)



Source: OECD (2023).

Focusing on the countries considered in depth in Chapter 3 that have implemented an acute, non-urgent telephone service, data was available for each of these countries with the exception of Scotland. Figure 4.14 shows that ED visit rates increased between 2011 and 2019 in each country, then fell between 2019 and 2021, likely due to the impact of the COVID-19 pandemic. ED visit rates varied among these countries ranging from 16.8 per 100 population in Sweden to 43.1 per 100 in England in 2021 These compare with a reported rate of 25.8 per 100 population in Ireland.(203)

Figure 4.14 Number of visits to EDs per 100 population, Denmark, Sweden, England, Australia, Ireland 2011, 2019 and 2021 (or nearest years)



Source: OECD (2023).

Similar to the Irish review of ED utilisation, international studies have shown that between 13.5% and 40.0% of ED attendances are potentially inappropriate or avoidable.[244, 246-249] These visits are characterised by low-urgency conditions treatable in primary care settings, or issues requiring only guidance or advice.[246, 250, 251]

As discussed in Chapter 2, there are currently telephone services for acute, non-urgent medical care implemented in 22 OECD countries: Austria, Australia, Belgium, Canada, Denmark, England, Estonia, Finland, Germany, Hungary, Iceland, Italy, Japan, Latvia, New Zealand, Northern Ireland, Norway, Portugal, Scotland, Sweden, Switzerland and Wales.[39-60] These services have been implemented with the intention to support the timely provision of care in the most appropriate setting. It is important to note that it is difficult to predict what healthcare issues callers to a telephone service will present with. As detailed in Chapter 3, there are challenges

interpreting data from these services. As highlighted, across the included studies, the most commonly reported reasons for contacting these telephone services were varied. The most commonly reported reasons were: illness not otherwise specified (19% to 66%); injury (11% to 34%); conditions related to the limb and extremities (10% to 22%); gastrointestinal conditions (16% to 19%); abdominal pain (12% to 19%); chest pain (15%); skin, wound and rashes (6% to 12%); fever (12%); vomiting/coughing/hiccups/bringing up blood (5%); and regarding new symptoms (69%) (see Table A7 in Appendix A for details).[94, 104, 105, 117, 120, 139, 140, 143-145, 148, 149, 151]

4.8 Inferred Irish demand for an acute, non-urgent telephone service

The target population of an acute, non-urgent telephone service is potentially diverse. There is not an easily identifiable group of people who may use this service, and as a consequence it is challenging to determine what the anticipated demand will be for an acute, non-urgent telephone service in Ireland. When considering the projected volume of callers to an acute, non-urgent telephone service in Ireland, consideration has to be given to each of the existing public healthcare options that are available to people at present. There is the potential that a proportion of people who are currently using each of these services could switch to using the telephone service.

An acute, non-urgent telephone service will also likely attract a significant number of calls from individuals who previously did not have access to, or were unaware of, other available healthcare services. In 2022, 3.6% of the Irish population reported unmet needs for medical care, with waiting times being the main reason for reporting unmet needs.[252] Data from the Scottish 111 and the English 111 phone services show the number of calls is increasing year on year and are higher than the rate of population increases. This suggests these services are being used more frequently and or are becoming more popular over time.[253-255] Internationally, high demand for telephone-based healthcare services is evident. For example, Sweden's 1177 service handles approximately four million calls annually.[65] If adjusted for Ireland's population, this could translate into an estimated demand of two million calls per year. While this highlights the potential scale of demand, direct comparisons across countries must be interpreted cautiously due to differences in healthcare system structures, service provision, and patient behaviours.

The projected annual demand for an acute, non-urgent telephone service is presented in Table 4.2. These estimates are inferred from the proportion of current demand in a range of settings that potentially could or would instead avail of an

acute, non-urgent telephone service. These figures are intended to provide an estimate of the potential demand for the acute, non-urgent telephone line, rather than a direct shift in demand away from these other services. It is important to recognise that these projections are approximations, and actual demand could be significantly higher than anticipated, particularly as awareness of the service grows and accessibility improves.

Some considerations:

- We assume services provided by GPs and primary care nurses during regular opening hours will not be impacted. That is, we assume that those patients who can and currently do go to their GP or primary care nurse are likely to continue to do so. While not considered within our estimates, it is possible that some consultations that are carried out by phone, and do not require a prescription, referral, or other action by the GP, could be addressed through an acute, non-urgent telephone service.
- In 2023, there were 1.1 million contacts with the GP OOH services participating in the HSE grant-funded cooperative schemes.[214] Based on data reported by the HSE, it is estimated that 29.2% (range 26.7% to 34.9%) of those that contacted these services in the period 2014 to 2023 (excluding 2020, 2021 and 2022 due to the impact of the COVID-19 pandemic), were not assessed by a GP in a treatment centre, by a GP home visit, or GP consultations conducted over the phone.[214] The assumption is that 5% to 15% of callers annually may use an acute, non-urgent telephone service instead. This would come predominantly from callers who do not progress to a consultation with a GP or nurse, either face to face or over the phone.
- The Public Attitudes Towards Pharmacy Survey carried out in 2024 revealed that 22% of approximately 2,000 respondents reported using a dedicated pharmacy consultation area within the past month; when this figure is extrapolated, it equates to 5.2 million consultations a year.[211, 256] There were approximately 600,000 consultations for influenza and or COVID-19 vaccinations in community pharmacy settings.[257, 258] After excluding vaccination consultations, the assumption is that 1% to 10% of people availing of pharmacy consultations may use an acute, non-urgent telephone service instead if available.
- Between August 2022 and July 2023, NAS Hear and Treat clinical staff managed 25,372 low-acuity calls. Of these, one third received clinical advice or were referred to non-emergency services, potentially avoiding 8,326 unnecessary emergency ambulance dispatches and ED transports.[224] The assumption is that 4,000 to 8,000 of these callers may use an acute, non-

urgent telephone service instead. While the assumption is around the potential for lower-acuity callers to emergency services to switch to an acute, non-urgent telephone service, it is also possible that some higher-acuity calls may switch to this service. However, there are no data available to accurately estimate the volume of these calls.

- In 2023, DFB managed 3,650 Alpha and Omega calls that were not transported to hospital.[232] The assumption is that 2,000 to 3,500 of these callers may use an acute, non-urgent telephone service instead.
- In 2023, there were 24,000 ED cases that were both triaged as non-urgent and not admitted to hospital.[235] While not admitted, it is recognised that a proportion of these cases likely underwent diagnostic testing and or received treatment. However, across these 24,000 cases, some or all may consider using a phone line for advice or to access an alternative service providing equivalent care. The assumption is that 10,000 to 24,000 of these cases may use an acute, non-urgent telephone service instead, if it was available. Individuals who attend injury units are likely to require medical intervention. As a result, potential shifts form injury units to the acute, non-urgent telephone service are not included in the projected demand.
- In 2022, 3.6% of the Irish population reported having unmet needs for medical care.[252] The assumption is that a proportion of these may use an acute, non-urgent telephone service. The introduction of a new service is also likely to generate supplier-induced demand, with an estimated 150,000–300,000 calls potentially coming from those with unmet needs, in addition to the new demand created by the service itself.

The projected annual demand for an acute, non-urgent telephone service ranges from approximately 270,000 to 960,000 calls. This inferred demand is based on the acute, non-urgent telephone service operating 24 hours a day, seven days a week. However, given international experience, the actual demand could exceed these estimates, particularly as service awareness improves over time.

Table 4.2 Inferred Irish demand for an acute, non-urgent telephone service

Service	Current total attendances in one year	Projected volume of calls to an acute, non-urgent telephone service	Source
GP (day time)	21,000,000	Not assumed to be impacted	
GP (out of hours)	1,100,000	56,000–168,000	5%–15% of contacts to GP OOH services in 2023 participating in the HSE grant-funded cooperative schemes[214]
Primary care nurse	8,000,000	Not assumed to be impacted	
Pharmacy consultation	4,600,000	46,000–460,000	1%–10% of people reporting used of pharmacy consultation area in 2024[211, 256]
National Ambulance Service	380,000	4,000–8,000	Number of low-acuity calls resolved by NAS Hear and Treat clinical hub between August 2022 and July 2023[224]
Dublin Fire Brigade	80,000	2,000–3,500	Alpha and Omega calls that were not transported to hospital in 2023[232]
Emergency department	1,500,000	10,000–24,000	Cases triaged as non-urgent in an ED and not admitted to hospital in 2023[235]
Total		118,000–663,500	
Unmet demand	185,000	150,000–300,000	3.6% of the Irish population reported having unmet needs for medical care in 2022[252]
Total		268,000–963,500	

4.9 Discussion

Ireland is experiencing a significant increase in demand for both primary care and emergency care services. This increase is driven by a growing and ageing population, with increases in the number of calls to emergency ambulance services and number of individuals presenting to EDs. The mounting strain on acute services is exacerbated by increased demand for access to primary care services coupled with a shortage of GPs, which are contributing to delays in access to care and unmet healthcare needs.

Irish EDs frequently serve as a single point of access to healthcare for individuals whose needs might be better served by alternative care at their GP or other community-based healthcare service. The use of EDs where alternative services might be more appropriate is multifaceted, driven by both individual and systemic factors. Factors such as access, awareness of other healthcare services, patient's self-assessment of illness severity, and confidence in the quality of care in EDs are significant contributors to unsuitable visits.[259-261] In its Statement of Strategy 2023–2025, the Department of Health has set out to explore the potential for introducing a 24-hour triage and health-concerns telephone and website service, which will help to direct patients into appropriate streams of care and potentially reduce unnecessary ED attendances.[262] The HSE's Urgent and Emergency Care Operation Plan 2023 focuses on improving urgent and emergency care performance.[263] It aims to reduce ED demand by various approaches including extended opening hours for injury units and extended GP direct access to community diagnostics for GP OOH cooperatives. ED visit rates varied substantially among countries. While highlighting these differences in ED utilisation among countries, it is recognised that there are potential differences in how healthcare is organised and the potential completeness of the data (for example, the extent to which ED care is provided by private facilities and whether or not these data are included in these estimates). Moreover, as highlighted earlier, ED visit rates are typically higher in those aged less than six years and in older adults; differences among countries in their population structures may therefore influence the rates observed.

Population groups that could be better served by alternative care include individuals with low-acuity conditions presenting to EDs, callers to ambulances categorised as having low-acuity needs, and those who contact GP OOHs services but who are triaged as not needing a consultation from a nurse or doctor. Additionally, alternative care pathways may offer a more efficient and timely response for individuals who might otherwise experience delays in receiving care through traditional channels.

Currently, demand surpasses capacity in both primary care and emergency care services in Ireland, with data indicating that this demand is continuing to rise. This trend suggests that there will be significant unmet demand in the short to medium term. Therefore, an acute, non-urgent telephone service could be beneficial in directing individuals to the appropriate healthcare services, ensuring they receive the right care at the right place and time. However, it is difficult to predict whether users would change their behaviour and refrain from accessing emergency services for low-acuity conditions. Furthermore, it is uncertain who would use the telephone line, and if used, whether it would reduce the use of emergency services for acute, non-urgent medical care needs. This may potentially leave the pressure on these services unchanged, or indeed generate additional demand. The projected annual demand for an acute, non-urgent telephone service ranges from approximately 270,000 to 960,000 calls. However, this wide range reflects the inherent uncertainty in the estimate, and the actual demand will depend on the specific services offered by the telephone service and their acceptability to users. This chapter has limitations as the data sources are reliant on self-reported data and surveys. The Irish data on EDs are incomplete as ED attendances in private facilities are excluded and no data were available for injury unit attendances in Ireland. These limitations introduce a further degree of uncertainty around the estimates used.

5 Organisational considerations

Key points

- The design of an acute, non-urgent telephone service should take into account the existing ecosystem of healthcare services in Ireland. A comprehensive understanding of the existing care pathways and the interactions among urgent care and primary care services and the telephone service is necessary, as some reorganisation within these existing services may be required in order to improve system efficiency and patient experience. The proposed telephone line is intended to support individuals navigate the healthcare system, as the available services are currently highly fragmented with limited integration. Such a telephone service would require close integration with existing services to avoid duplication and unnecessary use of resources.

- Core requirements of an acute, non-urgent telephone service include:
  - Tailored clinical decision support system (CDSS) software to support assessment and management of calls. CDSS software is designed to ensure consistency and safety by standardising, controlling, and monitoring the clinical knowledge in play for call operators.
  - Public awareness of what they can expect when they call an acute, non-urgent telephone service and what is outside the scope of the service. Key features include an easy-to-remember number, emphasis on fast triage, and advice on the correct care pathway.

- In designing an acute, non-urgent telephone service, consideration will need to be given to:
  - How much information the call operator would have in terms of the availability and capacity of other health services. If the system can cooperate with existing health services in a meaningful way and actively assist the caller to receive timely care in the most appropriate setting, then it is more likely to have greater perceived utility to the caller, leading to sustained demand.
  - Whether non-clinical or clinically-trained call operators would be used. Diverting a clinically-trained workforce from front-facing care could be considered an inefficient use of resources if the service does not reduce demand from direct patient-facing care. However, it may be efficient if the service successfully reduces duplication by directing patients to the most appropriate setting. Use of a non-clinical workforce is likely to be

associated with significant resource and training support requirements. A third option is to combine lay expertise (call operators) and professional expertise (clinical advisors) supported by a CDSS. Consideration would also have to be given to any specialist services (for example, mental health or dental services) that may be provided by the service, as this would require specifically-trained staff for these functions.

  - Whether the acute, non-urgent telephone service would operate 24/7 or at specific times only, such as evenings and weekends. This would have implications for rostering of staff and the recruitment burden (and overall costs) given the need to ensure adequate numbers of call operators are available to meet demand. Limited service hours may reduce access for those seeking non-urgent medical care attention during daytime hours and lead to uncertainty about when the service is available.

- The anticipated demand for an acute, non-urgent telephone service is likely to be impacted by the level of interaction between the telephone line and other healthcare delivery services in the healthcare system, what additional services are provided through the telephone line, whether the service is operated by a non-clinical or clinically-trained workforce, and whether the service operates 24/7 or at specific times only. A large portion of demand is also anticipated to come from currently unmet demand.

- The introduction of an acute, non-urgent telephone line could create supplier-induced demand, thereby increasing overall demand for primary and urgent care services, as a telephone service would not have an associated cost to the caller.

- Regarding organisational issues relating to implementation, monitoring and evaluation:
  - The design of an acute, non-urgent telephone service should be informed by consultation with the public and stakeholders in healthcare.

  - In considering how this service would be monitored and evaluated, there would be a need to balance patient experience and efficient and sustainable use of resources. KPIs would need to be revisited as the service becomes operational to ensure that performance is measured against realistic goals.

5.1 Introduction

The aim of this chapter is to provide an overview of the potential organisational considerations associated with providing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland. Key considerations, which would have cost and resource use implications, include how the telephone line integrates with existing services, the breadth of indications covered, the type of staff operating the telephone line, and the hours of availability.

The approach taken in the sections that follow is to outline the requirements and challenges in providing an acute, non-urgent telephone service within the context of existing healthcare structures in Ireland. These requirements and challenges were informed by the international literature reviewed in Chapter 3. As such, the chapter outlines the potential impact on existing pathways and or requirements for infrastructure and resources as well as the anticipated demand for the service. Considerations for implementation, monitoring and evaluation of an acute, non-urgent telephone service are also provided.

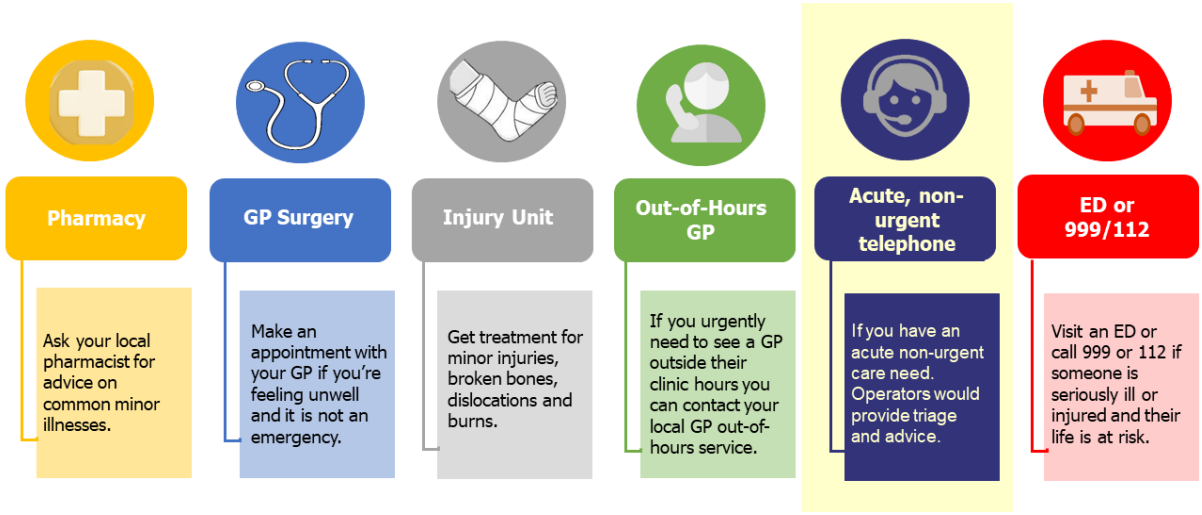
5.2 Infrastructure and resources

The rising demand for healthcare services, from a population that is getting older and has more complex healthcare needs, is placing considerable pressure on the Irish healthcare system. Patient needs and expectations, and the ways in which healthcare services can be delivered, are rapidly changing. Internationally, changes to service delivery have included accelerated investment in digital technologies that can build equity of access, rapid response and end-to-end service delivery.[183] Telephone triage can play an important role in managing demand for healthcare; establishing an acute, non-urgent telephone service is intended to support the provision of timely care in the most appropriate setting. As detailed in Chapter 3, acute, non-urgent telephone services can positively assist callers to access timely assistance and appropriate care. The criteria needed for an acute, non-urgent telephone service include demand for the service, suitable infrastructure and resources, and meaningful monitoring and evaluation. The evidence suggests that there are many independent factors unique to each country that can impact the implementation, integration and performance of an acute, non-urgent telephone service.

The current options to access publicly-funded healthcare in Ireland are described in detail in Chapter 2. Ireland's healthcare system faces a wide range of challenges, many of which are connected to access issues. Currently, there is overlap in the care provided by the available services, such that for an individual with a given medical concern, several of the available services may seem potentially appropriate places to

access care. As discussed in Chapter 4, the ageing population and associated growing demand on healthcare services is likely to exacerbate existing challenges for the Irish healthcare system. This highlights a need for collaboration among existing services and a greater understanding of where synergy can be introduced into the Irish healthcare system. As highlighted in Figure 5.1, it is assumed that an acute, non-urgent telephone service would be in addition to, rather than a replacement for, any of the existing options to access publicly-funded healthcare in Ireland. The introduction of this service could help ensure that people receive the right care at the correct entry point and potentially alleviate the growing pressure on existing services.

Figure 5.1 Addition of an acute, non-urgent telephone service to the health services currently available in Ireland



Key: ED – emergency department; GP – general practitioner.
Source: Adapted from HSE.ie.

5.2.1 Impact on existing health services

The aim of an acute, non-urgent telephone service in Ireland is to support the provision of timely care in the most appropriate setting, and the design of the service must reflect this aim. As highlighted in Chapter 3, the 'success' of an acute, non-urgent telephone service is dependent on an effective and cohesive network of urgent care, emergency care, and primary care services.[264] As such, a comprehensive understanding of the existing care pathways and the interactions among these health services and the acute, non-urgent telephone service is needed, as some reorganisation within these existing services may be required in order to minimise duplication of assessment and to improve system efficiency and patient experience.[138] For example, if an acute, non-urgent telephone service does not have the means of connecting callers to the appropriate level of care, this will limit

the potential of the service to contribute meaningfully to system efficiency and patient experience.[109, 116, 138] If an acute, non-urgent telephone service were to be implemented in Ireland, real improvements may only be gained if a series of coordinated measures designed to increase efficiency across all services is implemented.[130]

As detailed in Chapter 3, the international literature shows that callers to acute, non-urgent telephone services are typically advised to visit their GP (9% to 69%), attend the ED (5% to 49%), or are given self-care advice (7% to 51%). The impact of these dispositions (triage outcome) on the wider health system is a key point to consider in the design and implementation of an acute, non-urgent telephone service in Ireland. Reports on the impact upon individual services vary, and impacts may often occur across multiple services concurrently. Unless a call is closed with self-care advice, the outcome of a call is not to eliminate the need for interaction with a care provider, but to potentially change the setting in which care is delivered. The main effect may be a shift in resource use among different healthcare settings, and this effect may change over time. For example, in Scotland, in the first five years of NHS 24, the proportion of NHS 24 calls that required no further action from OOH GP, ambulance or ED services rose steadily from 15% to 40% by April 2005.[54] This resulted in a substantial decrease in OOH GP telephone advice calls, and the overall number of contacts at OOH GP cooperatives, alongside a decrease in the proportion of calls requiring a home visit or ambulance conveyance and an increase in appointments to see an OOH GP.[54] Of note, there was also an absolute increase in calls over that time period, which may indicate that the rise in volume of calls that required no further action could reflect a trend in the type of service user or need. The volume of calls requiring no further action has plateaued over the years to 21% in 2022/23 and 20% in 2023/24, and the target figure as of 2024 is >20%.[265]

Of note, a range of services has been implemented by individual hospitals in Ireland with the aim of reducing ED attendance and providing timely care in the most appropriate setting, and the success of these services should be taken into consideration in the context of designing a national acute, non-urgent telephone service. Pathfinder, a service designed to safely keep older people (65 years and older) who phone 112/999 in their own home rather than taking them to a hospital emergency department, was launched in 2020 as a collaborative service between the National Ambulance Service (NAS) and Dublin's Beaumont Hospital.[266] The service was also implemented in Limerick, Tallaght, and Waterford in 2022, and in Galway, Kilkenny, Cork, Kerry, and Letterkenny in 2023.[267] Of note, the service in Tallaght is no longer operating as of November 2024. The Pathfinder 'Rapid Response Team' responds to what are categorised to be low-acuity 999/112 calls relating to people aged 65 years and older living at home. An 'Ambulance Team',

comprising an advanced paramedic and a clinical specialist, occupational therapist or physiotherapist, responds to these 112/999 calls and manages the patients at their home as an alternative to ED conveyance, if appropriate.[266] During the first eight months of 2023, the service attended to 2,874 callouts. A total of 42% of the patients (1,207) involved were able to stay at home, where they availed of alternative pathways of care rather than going to hospital.[268] On average, between 2020 and 2023, two thirds of patients seen by Pathfinder following a 999 call remained at home rather than being brought to the ED.[267]

In addition to Pathfinder, Cork University Hospital (CUH) also operates an alternative pre-hospital pathway (APP) team, founded in November 2019. The APP Team is a collaboration between CUH and NAS, operating seven days a week from 10am to 8pm. The team responds to low-acuity 112/999 emergency calls, from all age groups, in the Cork area and aims to provide definitive patient care in the community or to refer patients to the appropriate community or specialist service.[269] A HSE South West Urgent Virtual Care (UVC) service, established in November 2024 and operating out of CUH, allows GPs and paramedics to consult directly by phone or by video call with a senior medical decision-maker in emergency medicine or geriatric medicine.[270] Galway University Hospitals have also piloted an Emergency Department Avoidance Programme for all age groups in 2024. This programme operated Monday to Friday from 9am to 1pm; GPs referred patients to a virtual navigational hub rather than referring them directly to the ED. Thirteen GP practices with 48 GPs were involved in the pilot, and over a five-month period the hub dealt with 108 referrals, with two thirds of these patients avoiding an ED visit as a result.[271] EDITH (Emergency Department in the Home) is operated by St. Vincent's University Hospital (SVUH), Dublin. EDITH is a frailty response service providing emergency medical and occupational therapy input to adults aged 65 and over in the SVUH catchment area seven days a week (8am to 6pm) who have been referred to the service by GP, Emergency Services or nursing home. EDITH was established to provide a patient-centred approach to ED care, with the aim also of reducing unnecessary ED attendances.[272]

While these initiatives being implemented by individual hospitals in Ireland have been successful in avoiding ED episodes in 999 calls, they have only addressed a small proportion of calls, suggesting that managing ED demand requires a lot of effort for small gains. For context, as detailed in Chapter 4, demand for emergency ambulances has increased in Ireland from 284,000 calls in 2017 to 312,000 calls in 2022. There may be important learnings arising from these initiatives regarding the extent to which the interventions have to be tailored to local conditions.

5.2.2 Integration and collaboration with existing health services

The strong organisational identity of existing primary and urgent care services in Ireland means that integrating an acute, non-urgent telephone line into the pathway could be challenging.[54] Successful integration or cooperation would require engagement with existing services to enable mutually understanding and trusting relationships. Where service change is imposed on people with little consultation, hostility and mistrust are likely to persist.[264] The initiatives highlighted in 5.2.1 are evidence of successful collaboration between services in the Irish healthcare system.

In addition to these services, integration with existing national helplines and specialist advisory services should also be considered. One such service is the Public Poisons Information Line, provided by the National Poisons Information Centre (NPIC).[273] This phone line enables members of the public to speak with trained specialists in poisons information and access timely, appropriate medical advice in cases of poisoning or suspected poisoning. Integrating the acute, non-urgent telephone line with services like the NPIC could support more streamlined triage, avoid duplication, and ensure callers are directed to the most appropriate clinical expertise when required.

As detailed in Chapter 3, each country considered is unique in the level of integration and collaboration with existing health services. For example, in the Capital Region of Denmark, the Medical Helpline 1813 was established to create a single entrance for non-urgent care during on-call hours. The service integrates OOH medical on-call telephone consultation into the 1813 number. This is also the case in Scotland where NHS 24 integrates with GP cooperatives, EDs and the Scottish ambulance service. In contrast, in England, NHS 111 was established with the purpose of providing advice and signposting people to the right level of service.

While an acute, non-urgent telephone service is not aiming to better integrate the existing range of healthcare services in Ireland, it is aiming to support the provision of timely care in the most appropriate setting. Considerations therefore include how much information the call operator of an acute, non-urgent telephone line would have in terms of the availability and capacity of other health services. For example, would they be able to identify available appointment times in another service and or secure an appointment in another service for a caller? If services are either highly localised (like GP services) or dependent on individuals to know what is happening on the ground, it may limit the ability of health services to cooperate in a consistent way. For example, an ED can hypothetically computerise queue data, so that the call operator of an acute, non-urgent telephone service could quickly see what demand is like at a given ED. The same is unlikely to be possible at an OOH GP centre, so a phone call would be necessary to know if someone is likely to get an appointment.

This would affect both the efficiency and the potential demand for an acute, non-urgent telephone service. Additionally, where the content of a call raises concerns about a person's safety, the operator should have clear protocols to escalate the issue to the Gardaí, Tusla or the HSE National Safeguarding Office to ensure appropriate intervention and support.

Whether the service would operate 24/7 or at specific times only, such as evenings and weekends, may impact on the integration of an acute, non-urgent telephone line into the health services. For example, if the service is provided at evenings and weekends only, then it will not overlap with in-hours primary care services, and will interact with OOH GP and ED services only. If the service is provided 24/7, it will require some degree of interaction or collaboration with all existing primary, urgent, and emergency care services. Ultimately, if the acute, non-urgent telephone service is limited in how much it can assist the caller, then it is likely to have limited uptake by the general public. If the system can cooperate with existing health services in a meaningful way and actively assist the caller to receive timely care in the most appropriate setting, then it is more likely to see sustained demand.

In designing the service, consideration should also be given to the multiple potential entry points through which the public might access the acute, non-urgent telephone service, other than directly calling the telephone service themselves. For example, if a user dials 112 or 999 and the operator determines that the call relates to a non-urgent medical issue, the call could potentially be transferred to the acute, non-urgent telephone service for triage. Similarly, where appropriate, calls could potentially be transferred from daytime and OOH GP service to the telephone service. These diverse access routes would require coordination across multiple parts of the healthcare system to ensure smooth call handover, clear public communication, and consistent triage standards. Incorporating these various access pathways would also facilitate broader integration and may help optimise the service's capacity to deliver timely and appropriate care.

One option is for 'virtual integration' where organisations work together through networks and alliances.[264] This network would be primarily enabled through technological integration (for example, communication and information sharing). For this type of integration to succeed, there needs to be good teamwork (so that barriers are broken down); responsibility for defined populations that enables relationships to develop over time; and partnerships between health professionals and managers in leading improvement.[274] Given that much of the communication among different healthcare services is electronic, with little personal contact among providers, it is important to note that technological integration alone is not enough to sustain an integrated service. Time and effort are crucial in promoting shared

communication and a strong relationship among healthcare services.[264] One facilitator to virtual integration would be a national electronic health record (EHR) in Ireland. An EHR provides a longitudinal record of information regarding the health status of an individual in computer-accessible form across practices and specialists, and enables immediate authorised access to clinical records.[274] In the context of an acute, non-urgent telephone service, an EHR could improve patient care by allowing the call operator access to the caller's medical history, thus facilitating accurate triage and ensuring the caller receives timely care in the most appropriate setting. As detailed in Chapter 3, while there are several similarities among Ireland's health care system and those of Denmark, Sweden, England, Scotland and Australia, a key difference is that each of these countries have a well-established EHR system which allows access to patient medical records across a variety of settings, including the acute, non-urgent telephone service. While implementation of a national EHR is planned in Ireland, progress has been slow.[275, 276] The lack of EHR in Ireland could limit the overall benefits of an acute, non-urgent telephone service if it was introduced in Ireland.

Another important question to consider is whether the introduction of an acute, non-urgent telephone service could create supplier-induced demand, where ease of access has the potential to induce demand, thereby increasing overall demand for primary and urgent care.[130] Evidence from a controlled before-and-after study involving pilot sites for the English NHS 111 urgent care telephone service highlighted that this could include generation of new demand and or people using the telephone service instead of in-hours primary care.[130] Of note, some people can experience barriers to getting timely access to appointments in some GP practices due to a lack of capacity. This may be a particular factor in influencing individuals to seek care through an acute, non-urgent telephone service. Another factor is the cost of GP appointments. This is particularly noteworthy in the Irish context, where individuals may incur an out-of-pocket payment for GP appointments, which may represent a barrier to access. As an acute, non-urgent telephone service would not have an associated cost to the caller, it could be seen as a means to reduce the burden on GP practices by providing a convenient, free-of-charge, highly-accessible alternative to a GP appointment for some patients, depending on their particular care needs. However, an important assumption in the projected demand is that individuals will not use the telephone service as a substitute for contacting their GP during regular hours. This suggests that the service is unlikely to reduce daytime demand for GP consultations and may, in fact, direct more individuals toward them, potentially increasing overall GP workload. However, this outcome is uncertain. While some callers may be advised to seek a GP consultation, others, particularly those with minor complaints, may be reassured or directed toward alternative care

options. This could be especially relevant for individuals facing long wait times for a GP appointment, who might otherwise choose to manage their condition at home. Given this uncertainty, it will be essential to monitor the service's impact on GP demand over time. A clearer understanding of caller behaviour and referral patterns will help refine the service's role within the broader healthcare system.

5.2.3 Technology

To operate an acute, non-urgent telephone service, tailored clinical decision support system (CDSS) software would be required to support assessment and management of calls. CDSS software synthesises clinical research into a series of algorithms which, when followed accurately, should produce consistent outcomes.[277] The system is designed to ensure consistency and safety by standardising, controlling, and monitoring the clinical knowledge in play for call operators.[264] Underpinning a CDSS is a conviction that there is an objectively 'correct' disposition for every condition. CDSS software, such as Advanced Medical Priority Dispatch System (AMPDS), Irish Children's Triage System, and Manchester Triage System, is currently used for triage in urgent and emergency care in the healthcare system in Ireland. The system is an interlinked series of algorithms, or pathways, that link clinical questions and care advice, leading to clinical endpoints. It presents the call operator with a series of questions asked according to a clinical hierarchy, so questions about potentially life-threatening conditions are asked early in the call, progressing through to questions about less urgent symptoms. Based on the answers given, the system suggests the most appropriate clinical response with a specific level of care and the time frame for same. If the CDSS system identifies that the caller's condition may be an emergency, it should be designed to quickly flag this and ensure the call is seamlessly transferred to 112/999 emergency services for immediate attention. In addition to identifying emergency calls, the CDSS should be designed to facilitate seamless redirection of calls to other national helplines and specialist advisory services where appropriate. For example, a call relating to a suspected poisoning could be directly transferred to the National Poisons Information Centre (NPIC) for specialist input. An example of a tailored CDSS in use for an acute, non-urgent telephone service internationally is NHS Pathways, which is used in England to support non-clinical, trained operators in the remote assessment of callers to NHS 111.[278]

A tailored CDSS may allow staff to work more efficiently or safely, or enable substitution or reallocation of tasks.[277] The design of the CDSS may also influence the required workforce skill-mix and configuration; for example, allowing non-clinically-qualified call operators to answer and triage calls to an acute, non-urgent telephone service. To ensure the technology can be used safely by non-clinical staff,

CDSS are inherently risk averse in their design. However, this can result in systems that are less able to discriminate (potentially) life-threatening cases from less-urgent cases. The questions asked in a CDSS are more closed-ended and the dialogue focuses mainly on symptoms, which means that other (potentially relevant) aspects that could provide a richer picture of the situation are ignored.[111]

It is difficult to devise a CDSS that has both high sensitivity and high specificity, and it is inevitable that choices are made to strike a balance based on the appropriateness or suitability of advice the caller receives to address their health concern. Advising the caller to seek the appropriate care could potentially save resources, whereas over-triage (that is, referral to a higher level of care than is needed) could lead to an inefficient use of the healthcare system, and under-triage (advice or referral to a lower intensity of care than is needed) could result in safety issues for the patient. If a CDSS is intended for use by non-clinical staff, the default is to design a system that has high sensitivity, that is, that it will correctly classify urgent and life-threatening cases. Flexible, non-standardised use of the system is a means of mediating the (real or perceived) 'oversensitivity' of a CDSS. However, there is a potential concern that flexibility for call operators when using the CDSS may lead to using more subjective rather than objective judgment.[264] High levels of clinical support and monitoring (for example, audit and ongoing training) may help to temper this. A CDSS may require new resources to support its effective use — for example, requiring new roles, new organisational functions, and considerable management time, all — perhaps — on an ongoing basis.[277] Once implemented, CDSS software requires ongoing support and, potentially, innovations from the technology developers.

An important factor to consider is that the introduction of an easy-to-remember three-digit number for an acute, non-urgent telephone service could result in people calling it by mistake instead of calling 112/999. The system must be designed so that the transfer of calls between 112/999 services and an acute, non-urgent telephone service would be seamless, even if they were operated by different organisations. It should also be considered that the acute, non-urgent telephone service would act as a signposting service, directing some patients to the HSE website where they can find information about self-care for certain medical concerns. This could increase the overlap in the care provided by the available health services in Ireland, and the confusion that members of the public may feel regarding which service they should access for a given medical concern. In designing an acute, non-urgent telephone service, consideration would also have to be given to investing time and resources into keeping the HSE website up to date, and relevant to patient needs.

Finally, advancements in technology have the potential to impact the delivery of services provided by an established acute, non-urgent e telephone line.[43] The use of video in triage is becoming increasingly important. In 2020, the Yorkshire Ambulance Service in the UK piloted the use of videoconference technology for 'hear and treat' consultations, which is similar to the Hear and Treat service offered through the 112/999 emergency services in Ireland.[279] The study concluded that video triage for low-acuity calls had high levels of patient satisfaction compared with standard telephone triage. Furthermore, clinical staff reported that video triage improved clinical assessment and decision-making compared with telephone alone.[279] If consideration is being given to incorporating video triage in an acute, non-urgent telephone service in Ireland, this must be accompanied by efforts to prepare for and protect against breaches of security and privacy, and ensure acceptability for both callers and operators.[280] Existing telephone-only services, such as GP OOH, are currently inaccessible to many in the Deaf and hard of hearing community. To avoid reinforcing this barrier, the acute, non-urgent telephone service should provide accessible communication options from the outset, including real-time text messaging, email, and video-calling with access to Irish Sign Language (ISL) interpretation. While the availability of ISL interpreters is currently limited, planning and funding must anticipate these needs to meet legal and equity obligations under the Irish Sign Language Act 2017. NHS 111 in England operates a text relay service which allows users to communicate via text using the Relay UK app, where a relay assistant converts the typed message in to spoken communication for the NHS 111 call handler and vice versa.[281] NHS 111 also provides access via British Sign Language (BSL) video relay, enabling those who are deaf to communicate through a BSL interpreter using platforms such as SignVideo.[282]

Artificial intelligence-based applications (apps), such as chatbots, symptom checkers, virtual assistants, and clinical decision support tools, also have significant potential to increase the efficiency of telephone triage programmes and improve patient experiences and outcomes.[43] These apps may also help to address language issues for non-English speakers, who may find such options more accessible. These apps have been implemented to varying degrees internationally, and it is noted that a health phone app for patients was launched by the HSE this year. The HSE app allows people to store their medical card or European Health Insurance Card details, with the intention that the app will evolve over time to become a key patient engagement platform with the health services.[283] Included in this, is the intention to create a National Shared Care Record to support secure sharing of health information, improved clinical decision-making and integration of care among providers (including between acute and community services), and improved patient

experience and outcomes.[284] Consideration should be given to how the functionality of this app could be incorporated into the design and implementation of an acute, non-urgent telephone service. Of note, if an online platform or app were to be incorporated into the design and implementation of an acute, non-urgent telephone service, the expectation among the general public would be that this technology would be available 24/7. Use of artificial intelligence (AI) will also likely play an increasing role in digital medical products. Developers and providers of digital medical products will have to conform to European regulatory requirements including the EU Medical Devices Regulation (MDR) and the AI Act, where relevant.[285]

5.2.4 Staff

Call operators working within the context of an acute, non-urgent telephone service for low-acuity calls are mainly employed to triage callers and to direct patients to the most appropriate care, as indicated by the CDSS disposition. This work entails a range of tasks, many done in parallel. The call operator must listen to the patient, talk to them and ask questions, read the screens, type in information, and navigate the system.[277] Call operators may also be required to transfer calls to a clinical adviser for further assessment, transfer calls to out-of-hours primary care services, or to arrange an emergency ambulance.

Implementation of an acute, non-urgent telephone service could lead to workforce expansion, with more staff being employed and additional roles created. It is noted that the health sector in Ireland is currently experiencing staff shortages, and services face significant resourcing challenges.[286] It is likely that these issues would similarly affect staff recruitment for an acute, non-urgent telephone service.[286] The proposed telephone service would require similar resources to existing OOHs and ambulance services, particularly in terms of trained non-clinical and clinical staff. If a decision is made to implement the telephone service, then careful workforce planning would be necessary to avoid undue strain on existing services. While there may be flexibility as to where the service centre is located, staff would potentially be required to attend the call centre and may not be able to work remotely. One option for staffing an acute, non-urgent telephone service is to exclusively rely on a clinically-trained workforce. As highlighted in Chapter 2, this is the current model of care used by 15 of the 22 OECD countries with an acute, non-urgent telephone service. In services using clinically-trained call operators to answer and triage calls, nurses are the dominant profession (n=12), although some services also include other members of defined professional groups, such as paramedics or doctors. It should also be noted that recruiting a clinically-trained workforce to operate an acute, non-urgent telephone service would potentially remove them from front-

facing healthcare delivery in primary and urgent care, which could be considered an inefficient use of resources if the service does not reduce demand from direct patient-facing care. However, it may be efficient if the service successfully reduces duplication by directing patients to the most appropriate setting.

Services in England, Italy, Scotland, and Wales employ non-clinical, trained call operators to answer and triage calls. In all four of these countries, the operator can transfer calls to a clinically-trained adviser for further triage and assessment. In England, clinical advisers play a key role by supporting callers, providing an additional assessment of complex calls and sometimes managing dispositions by using their experience and expertise.[264, 277] This merging of lay expertise (call operators) and professional expertise (clinical advisors) supported by a CDSS is reflected in other countries, and is also how low-acuity 999/112 calls are currently handled by the national emergency operations centre (NEOC) staff in Ireland, where call operators will transfer low-acuity calls to the Hear and Treat service. The Hear and Treat service is provided by nurses and doctors who call people back and help direct callers to a more appropriate entry point to the healthcare system, rather than an emergency ambulance. Clinical staff in the Hear and Treat service use an adapted version of the Manchester Triage Score when giving advice to callers. Where telephone advice is not sufficient, patients can be triaged to receive on-scene management or hospital transport.[2] A study of NHS 111 found that many existing call operators were 'dual trained', taking both 111 and 999 calls, although newly-recruited staff were trained only to take NHS 111 calls.[264] If the same provider were to operate both the existing and the acute, non-urgent telephone service, the use of dual-trained staff could improve the resilience of both services by allowing for efficient reallocation of staff if demand levels fluctuate. It may also lead to improved job satisfaction and staff retention if staff can rotate between these different services.

However, the literature also highlights that employing a non-clinical workforce to manage calls does not necessarily lead to reduction in overall costs or an improvement in staff recruitment or retention. The apparent advantage of a non-clinical workforce has to be set against the resources and structures needed to support these staff. This includes the need for training and ongoing clinical supervision and support, as well as the necessity to refer many calls upwards to nurses and doctors. The international literature also highlights that issues of non-compliance with triage advice is higher when non-clinical staff are employed.[93, 264]

If an acute, non-urgent telephone service were to be introduced in Ireland, consideration would also have to be given to any specialities that may be provided by the service — for example, mental health or dental services — as this would

require specifically-trained staff for these functions. Internationally, most countries who provide an acute, non-urgent telephone service also provide a mental health function as part of this service, and they have the capacity to put patients in touch with an urgent dental service if required. If clinical specialties are included in the scope of the service, integration with existing services like mental health services would be particularly important for ensuring continuity of care. As detailed in Chapter 2, in Ireland, a HSE mental health signposting service operates from NEOC. This 24/7 service is staffed by specially-trained emergency call takers. When callers access the service, they receive guidance on where to access mental health services in their local area; however, of note, the current service does not provide clinical advice or support.[32] In Ireland, any patient who requires emergency dental treatment is advised, in the first instance, to contact their own dentist or the OOH GP. In cases of extreme swelling which affects the airways, individuals are advised to contact their local ED.[287] There are two dental hospitals in Ireland. The Dublin Dental University Hospital Accident & Emergency (A&E) accepts walk in patients for the management of acute pain, severe infection, haemorrhage, orofacial trauma, swelling or possible/suspected cancer. There is a limited service most evenings and weekends. At weekends, the A&E is not operated as a walk-in clinic. Patients must first contact a dedicated phone line and leave a message for on-call staff who will return the call and discuss the need for the patient to attend the Department.[288] The Cork University Dental School and Hospital asks patients requiring emergency treatment to contact a triage line that operates between 9am and 1pm. Patients speak to a dental nurse who triages the call. In some cases, advice is offered to callers, and when they require to be seen by a dentist, an appointment is made for the caller.[289]

Finally, a key consideration in the staffing of an acute, non-urgent telephone service is whether the service would operate 24/7 or at specific times only, such as evenings and weekends. Either of these options would impact on existing health services to different degrees. Of the acute, non-urgent telephone services considered in Chapter 3, each of the countries operate a service that runs 24 hours a day, seven days a week, with the exception of Belgium where the service operates at weekends and public holidays, and Denmark where the service operates at evenings and weekends. Currently in Ireland, the 'Hear and Treat' service provided by medical and nursing staff in NEOCs Clinical Hub operates from 7am to midnight, seven days a week. Typically, there is at least one NAS Specialist Paramedic and one doctor available in the clinical hub from 10am to 10pm on most days. As highlighted in Chapter 4, the number of non-urgent presentations to EDs in Ireland in 2023 was twice as high on weekdays (2%) compared with weekends (1%). The international literature shows that in England and Scotland, call volumes are considerably higher outside of normal

office hours; between 82% to 90% of calls are made in the out-of-hours period, with the majority of calls made between the hours of 7pm and midnight.[290] If an acute, non-urgent telephone service in Ireland operated 24/7, it would result in increased demand during these time periods, which would require a corresponding increase in resources for service delivery, presenting challenges in recruitment, investment, and infrastructure. Some portion of this demand could be more appropriately managed in other less resource-intensive settings. However, not having the service available 24/7 might create gaps in service delivery and confuse members of the general public as to when the acute, non-urgent telephone service number is available. It might also undermine public confidence and satisfaction, as individuals might not receive timely responses. Consequently, individuals may turn to other healthcare services. As mentioned in Section 5.2.2 whether the service would operate 24/7 or at specific times only would also impact on how the service integrates and collaborates with existing health services.

5.2.5 Training

As discussed previously, call operators for acute, non-urgent telephone services provide a supportive role for entry to the healthcare system. Specific training may strengthen their capacity for this role.[291] A study of the organisational implications of NHS 111 found that while not clinically trained, call operators need considerable communication and elicitation skills in their work.[264] This has implications for the training requirements and the level of ongoing support that these staff require. Training needs will also be affected by staff retention and turnover.

Training requirements for emergency call takers and call operators for an acute, non-urgent telephone service are not standardised internationally due to the different CDSS software that countries use. In Ireland, ongoing training for emergency call takers is provided at the NAS college. Call takers complete core programmes accredited by the Pre-Hospital Emergency Care Council (PHECC) in accordance with Education & Training Standards.[292] While not directly applicable, it is likely that the training requirements of call operators for an acute, non-urgent service in Ireland would be broadly comparable to that of emergency call takers.

As detailed in Chapter 4, it is challenging to anticipate the patient profile that would use an acute, non-urgent telephone service; therefore, training may have to adapt to needs over time as the service is bedded into the existing healthcare structure. A 2017 Cochrane report concluded that more research is needed to assess the effect of different training interventions on call operators' telephone consultation skills and on patient outcomes.[293] Ongoing formal and informal coaching has been successfully provided to NHS 111 staff in England through buddying systems and support from call supervisors and clinical staff.[264]

The international literature highlights that acute, non-urgent telephone services receive calls about a range of issues that are broader than healthcare. The types of calls received by the service shape the everyday work for call operators. In England, a study of NHS 111 staff found that a small proportion of calls concern 'social problems', with callers seeking reassurance or a friendly ear to talk to. Once a medical need is ruled out, call advisers provide unscripted reassurance or support, relying on their communication skills and experiential knowledge. These types of call were sometimes from repeat callers to the service.[264] Within the context of introducing an acute, non-urgent telephone service in Ireland, ongoing formal and informal training of operators in areas such as patient safety, communication, technology, and emotional capacity would be necessary to support a safe and efficient service that avoids under-triage and reduces over-triage.

5.2.6 Information and awareness

Awareness or knowledge of an acute, non-urgent telephone service is likely to affect user uptake. For example, a survey of people self-referring to EDs in the Capital Region of Denmark reported that lack of knowledge of the 1813 service and its functions had a large part to do with their non-use of this service. Following education regarding the service, most of those surveyed reported that they would call 1813 in the future.[102] A survey (n= 40,744) in Sweden in 2012 reported between 52% and 72% of persons over 18 years of age were aware they could call 1177 for advice and help with healthcare. Awareness was lowest among older age groups.[112]

Of note, the introduction of this service would require a range of information to be conveyed to the general public (for example, when the phone line is active and what supports are offered through it). This would be a complex campaign that would require clear messaging to ensure the public have realistic expectations of the functions of the telephone service. Publicity campaigns that educate the general public on the role that an acute, non-urgent telephone line serves and the appropriate use of this service are important to maximise their potential impact. People should be aware of what they can expect when they call an acute, non-urgent telephone service and what is outside the scope of the service; for example, the service may not be able to make appointments for the caller or advise them on how busy an ED is at a given time.

Key features that should be highlighted for the general public include an easy-to-remember number, emphasis on fast triage, and advice on the correct care pathway. Moreover, any publicity campaign would need to include information on when the telephone service is available — for example, if it is operated 24/7 or if it operates at specific times only, such as evenings and weekends. Advertising to raise awareness

could also be undertaken at EDs as well as GP surgeries and community pharmacies.[149] Targeted publicity campaigns to encourage use of telephone-accessed healthcare among older people and those in rural locations should also be considered, and whether higher awareness leads to increased use of the acute, non-urgent telephone service among these demographics should be monitored.[188] Efforts beyond simple publicity campaigns may be required to address the perception among people who are aware of the service, but do not think it will be helpful.[149] Of note, it will also be necessary to raise awareness among staff in other health services of the role of an acute, non-urgent telephone line and how it might impact on existing health services. The public information campaign on how to use the service must also be accessible to those who are deaf and hard of hearing, and should include Irish Sign Language (ISL) videos as well as audio-visual materials with captions.

5.3 Anticipated demand

Bearing in mind the key infrastructure and resource considerations detailed in Section 5.2, the anticipated demand for an acute, non-urgent telephone service will be impacted by:

- the level of interaction between an acute, non-urgent telephone line and other healthcare delivery services in the healthcare system
- the provision of additional services through the telephone line — for example, dental and or mental health services
- whether the telephone service is operated by non-clinical, trained call operators to answer and triage calls, and or by a clinically-trained workforce
- whether the telephone service operates 24/7 or at specific times only, such as evenings and weekends.

As detailed in Chapter 4, based on the available Irish data, the volume of calls to an acute, non-urgent telephone service is estimated to be within the range of 350,000 and 1.1 million calls per year. The international evidence shows that the largest user subgroup of callers to an acute, non-urgent telephone service is those aged 20-64 years (50% of adult callers) followed by people aged 0-19 years (35%) and finally those aged 65 years and older (15%). In the paediatric population, calls are most frequently in relation to those aged one to four years. These proportions largely reflect the age distribution of the population, and suggest that calls are made by and for people of all ages, reflecting a wide spectrum of possible medical issues. Given the differences among the healthcare systems, the extent to which the international evidence is indicative of likely demand in Ireland is uncertain. The budget impact

analysis in Chapter 6 will explore the budget impact associated with introducing an acute, non-urgent telephone service for a range of plausible uptake scenarios.

If an acute, non-urgent telephone service can contribute to people receiving care at the most appropriate level, it is important that all groups gain equal access to the service. The international literature highlights users who are more likely to avail of telephone triage services include parents (especially those with young children), individuals without a primary care provider or with limited access to primary care services, individuals living in remote areas, and those who have newly moved to a country.[43] Other user groups may be less likely to avail of an acute, non-urgent telephone service, such as younger individuals with fewer medical concerns, individuals with complex medical conditions who are receiving specialised care, and those with chronic diseases who are regularly in contact with healthcare providers.[43]

Geographic location plays a significant role in healthcare accessibility, particularly in rural or remote areas where healthcare resources and providers may be limited. In Scotland, criticism of the national NHS 24 model came from people in rural or remote communities. These people were accustomed to local service delivery and many felt the national model did not consider the differences in healthcare delivery required for such locations, including the lack of access to healthcare services such as emergency or primary care centres.[294] In Census 2022, the population density of Ireland was 73 people per km^2.[226] In Scotland, the population density in 2022 was 70 people per km^2.[195] Rural areas constitute 98% of Scotland's landmass and 17% of its population, while rural areas constitute 99% of Ireland's landmass and 36% of its population.[295-297] However, caution is required in comparing these two countries directly, as in mid-2020, 91% of Scotland's population lived in settlements and localities (defined as an area type with 500 people or more), while in 2022, 68% of Ireland's population lived in an area type with 500 people or more.[298-300] This shows that while Scotland has a distributed population at a national level, it is still concentrated into settlements and localities. Ireland differs because in large parts of the country there are people without discernible settlements. This means that, in the absence of population centres, it is very hard to deliver healthcare services in an efficient way. Additionally, the triage of remote and rural callers may require a different approach to achieve appropriate outcomes.[54, 143] For example, means of travel or transport to healthcare services and whether conditions can impact on decision-making.[294] However, a common feature of acute, non-urgent telephone services is that they can be accessed by people, irrespective of their geographic location. While the effectiveness of telephone triage services may depend on the availability of local healthcare providers for the individual to be referred to, the ability to seek advice and support from healthcare professionals in a timely manner,

regardless of where the individual is located, might help mitigate some health inequities.[43, 142] Undertaking rural proofing prior to implementing an acute, non-urgent telephone service in Ireland could help ensure that the advice given takes into account the local and individual context of the caller. It could also support identification of possible impacts of the service, and highlight any necessary adjustments.[294]

Callers' access requirements were considered in the international literature. A report from the Nurse-On-Call service in Victoria reported that callers from non-English language backgrounds, and hearing- and speech-impaired callers were significantly under-represented among service users. Out of a total of 338,824 calls in a one-year period, fewer than 100 calls required an interpreter, and there were only 38 calls to the national teletype service for hearing- or speech-impaired callers.[150] This shows that non-English speakers or those who are speech impaired are not using the service. Victoria is Australia's most culturally diverse state. Over 23 per cent of Victorians were born overseas, of whom 72 per cent were born in non-English speaking countries. Thus many potential callers may not speak English, or may have English as their second language.[150] To encourage these people to use the service, the telephone line is advertised to those who do not speak English, and publicity material is available in numerous languages.[301] The Irish population is heterogeneous with diverse needs. In considering the design of an acute, non-urgent telephone service in Ireland, consideration would need to be given to supports, such as audio interpreter, video interpreter, and teletype services to enable all groups gain equal access to the service. Consideration would also need to be given to ensuring the service number was accessible for people in Ireland calling from non-Irish phone numbers.

5.4 Implementation, monitoring and evaluation

This HTA is focused on evaluating the potential for a telephone service for acute, non-urgent medical care needs. A HTA does not provide an implementation plan. However, in considering the organisational impacts of introducing a new service in the Irish healthcare system, it is important to acknowledge the required key steps to ensure the design and implementation of an effective service.

As discussed previously in this chapter, unless closed with self-care advice, the outcome of a call is not to eliminate the need for interaction with a care provider, but to potentially change the setting in which care is delivered. In designing an acute, non-urgent telephone service, it will be necessary to consult with stakeholders from other areas of the healthcare service who may be impacted by the introduction of this intervention, such as primary and urgent care services, along with the general

public who will be encouraged to use this service. Meaningful engagement at the design phase will encourage buy-in from key stakeholders, including members of the general public, to ensure that their voice is at the centre of the design of this intervention.

Given that the impetus for this intervention is nested in the Sláintecare vision, the implementation approach should be consistent with its overarching goal of reorientating the health service towards a high-quality, integrated system that provides care on the basis of need, not ability to pay, with the vast majority of care delivered in primary and community settings.[302] Planned reforms under Sláintecare aim to improve integration and coordination across the health system, strengthen primary care, and enhance digital connectivity. If these reforms are successfully implemented, they may provide a more supportive environment for introducing a telephone triage service of this scale. Implementing an acute, non-urgent telephone service will require consideration first of who should provide this service. NAS, who operate out of the NEOC, are potentially well placed to incorporate such a service into their existing suite of services, and they could provide expertise required to implement an acute, non-urgent telephone line. Having this service run directly under the HSE could remove barriers related to data sharing and system access, and would enable it to leverage off existing infrastructure and facilitate a more seamless integration with other HSE services. However, the option of sending this service out to open tender through the HSE should also be considered. One of the key features of open tendering is its transparency. The HSE can promote competition by making the procurement process available to all interested parties. If this service was sent out to open tender, the HSE would have to define certain standards and expectations as part of the tendering process based on the key considerations highlighted in this chapter. Those considerations are: the level of interaction between an acute, non-urgent telephone line and other healthcare delivery services in the healthcare system; the availability of additional services through the telephone line (for example, dental and or mental health services); whether the telephone service would be operated by non-clinical, trained call operators to answer and triage calls, and or a clinically-trained workforce; and whether the telephone service was operating 24/7 or at specific times only, such as evenings and weekends. Finally, it is worth noting that the three private healthcare insurers operating in Ireland (Irish Life Health, Laya Healthcare, and VHI Healthcare) each currently provide members with access to a medical help line where qualified nurses provide non-emergency medical advice 24 hours a day, 365 days a year.[303-305] Their expertise in implementing and operating such a service could make them potential candidates to tender for a national service.

The provider of an acute, non-urgent telephone service would need to outline concrete and well-defined implementation steps, such as recruiting suitable staff, obtaining an appropriate CDSS system, obtaining premises from which this centralised national number will operate from, and attempting to integrate and cooperate with existing primary care and urgent care services. At the same time, implementation planning should be seen as a continuous process, which sits alongside effective project management, so that reform in practice can adjust to new trends and real experience. The implementation approach should then set out actions to be taken in the first years of the acute, non-urgent telephone service process. These can be further developed into annual action plans. There should also be a robust period of testing to ensure consistency of assessment, alignment of dispositions to services, and system resilience, which are critical before a service goes live.[45]

Under the Official Languages (Amendment) Act 2021, public services are required to provide services in Irish to the public, where appropriate. Consideration needs to be given to this as it may have implications for staff recruitment, interpreter support, call-handling protocols and the provision of information materials in Irish. Dedicated funding and planning may be required to ensure compliance, and this could also impact downstream services, if Irish-language service delivery is expected across multiple points of contact.

In considering the potential for an acute, non-urgent telephone service in Ireland, consideration should be given to how the performance of this intervention would be monitored and evaluated. Performance measurement in the healthcare environment is challenging, and a wide range of metrics and concepts have been created to evaluate the performance of healthcare systems. In considering an acute, non-urgent telephone service, there would be a need to balance patient experience and efficient and sustainable use of resources. Key performance indicators (KPIs) would need to be set and revisited as the service becomes operational to ensure that performance is measured against realistic goals.

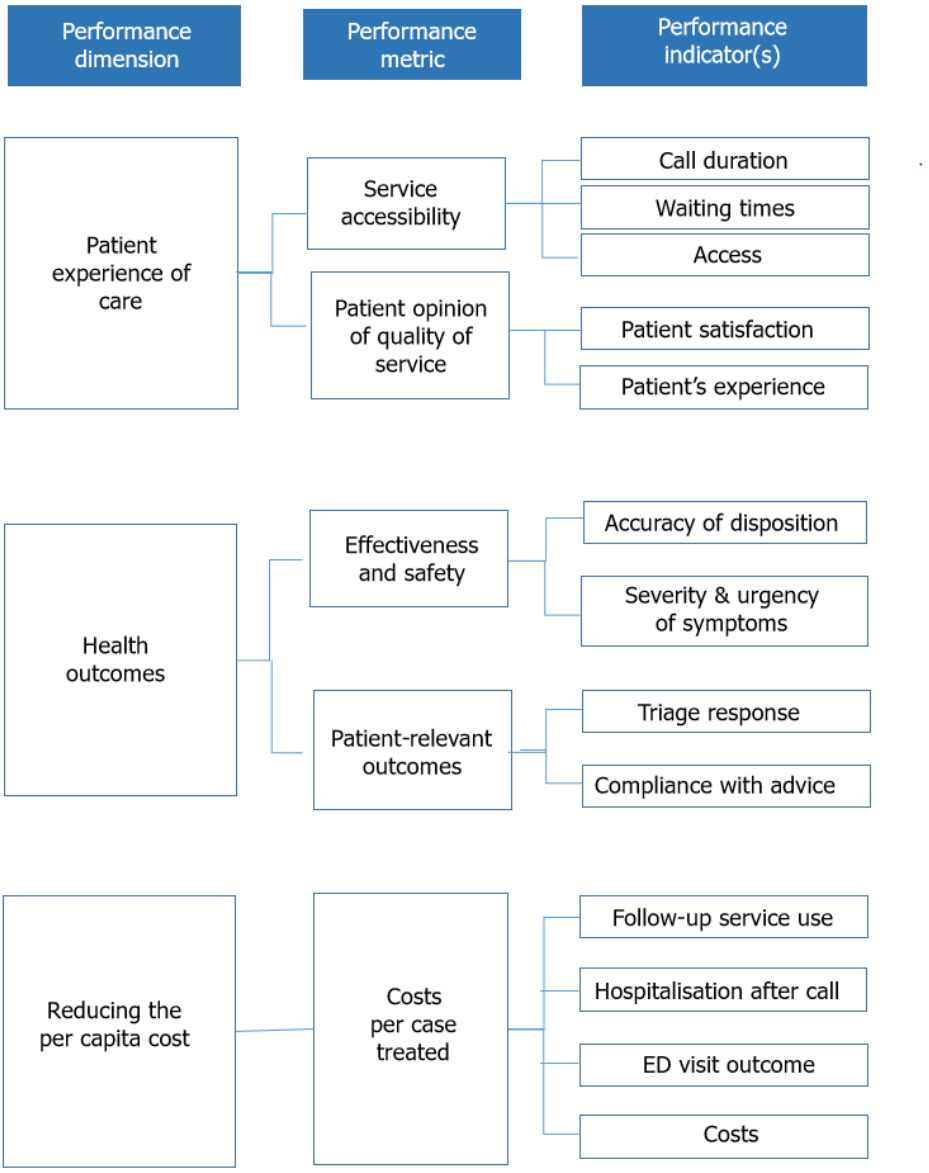
A typical way of measuring overall performance is to use a performance measurement framework covering relevant dimensions. However, the literature does indicate that no framework has been developed to measure the performance of telephone triage. Still, the need for comprehensive, acceptable and viable performance indicators to underpin a measurement framework is emphasised internationally.[45, 136, 306] A 2016 study identified factors that indicate quality in telephone nursing, such as the availability and simplicity of the service, sustainable working conditions, call-handler education and experience, healthcare resources and organisation, good communication, person-centredness, competence, correct and

safe care, satisfaction, and efficiency.[307] The authors of a 2024 scoping review focused on identifying metrics for the performance of telephone triage in urgent and non-urgent care; developed a framework with 13 performance indicators (Figure 5.2) covering the relevant dimensions of service accessibility, patient opinion on the quality of service, effectiveness and safety (for example, rates of under- and over-triage); patient-relevant outcomes including compliance with the advice received; and costs per case treated.[192] Of note, the impact of targeted publicity campaigns to encourage use of telephone-accessed healthcare among older people and those in rural locations should also be monitored to ensure there is awareness of the service.

As detailed in Chapter 3, multiple studies were identified that explored the performance of an acute, non-urgent telephone service in Denmark, England and Scotland.[45, 54, 98, 102, 103, 112, 115, 121, 129-137, 139-141, 149, 150, 188, 306] Table A11 in Appendix A provides details of service goals and quality development as reported. Performance was primarily explored through the volume of calls to the service, how members of the public perceived and used the service, the time of day calls were made and if the acute, non-urgent telephone service was the caller's first point of contact with the health system. However, as noted in Chapter 3, caution is required in comparing service use and service goals across countries. This is as a result of differences in the acute, non-urgent telephone services being delivered, the wider health system in which the service is operating, and the different service goals being set.

As also outlined in Section 5.2.2, the success of an acute, non-urgent telephone line in Ireland would depend greatly on how well it integrates and cooperates with existing services. Call operators may be required to advise patients to book an appointment with their in-hours GP, to transfer calls to out-of-hours primary care services, or to arrange an emergency ambulance. Evaluation of an acute, non-urgent telephone service would also have to look at whether the transfer of calls to different services is appropriate. Evaluating the impact of an acute, non-urgent telephone line on other services would be difficult to measure given the number of stakeholders involved.

Figure 5.2 Performance framework for telephone triage services



Source: Adapted from Vainio et al., 2024.[192]

5.5 Discussion

Telephone triage can play an important role in managing demand for healthcare; establishing an acute, non-urgent telephone service in Ireland is intended to support the provision of timely care in the most appropriate setting. If a decision is taken to establish this service, there are key considerations which would have cost and resource-use implications and which are likely to impact on the anticipated demand

for this service. Notable organisational issues relate to how the telephone line integrates with existing services, the type of staff operating the telephone line, hours of availability, and the inclusion of specialties such as dental and mental health.

The design of an acute, non-urgent telephone line should take into account the existing ecosystem of health services in Ireland. Successful integration of this telephone service would require engagement with existing services to enable mutually understanding and trusting relationships. A comprehensive understanding of the existing care pathways and the interactions between these health services and the telephone line is needed, as some reorganisation within these existing services may be required in order to minimise duplication of assessment and to improve system efficiency and patient experience. In the absence of fully-integrated services, call operators may have limited information regarding the availability and capacity of other health services. This would affect both the efficiency and the potential demand for an acute, non-urgent telephone service.

If an acute, non-urgent telephone service were to be introduced in Ireland, consideration would also have to be given to whether the telephone service is operated by non-clinical, trained call operators to answer and triage calls, and or by a clinically-trained workforce. Implementation of an acute, non-urgent telephone service could lead to workforce expansion, with more staff being employed and additional roles created. Of note, the literature highlights that employing a non-clinical workforce to manage calls does not necessary lead to reduction in overall costs or an improvement in staff recruitment or retention. Another key consideration in the staffing of an acute, non-urgent telephone service is whether the service would operate 24/7 or at specific times only, such as evenings and weekends. This would have implications for rostering of staff given the need to ensure adequate numbers of operators are available to meet demand during busy time periods. Not having the service available 24/7 might create gaps in service delivery and confuse members of the general public as to when the telephone service number is available. If an acute, non-urgent telephone service were to be introduced in Ireland, consideration would also have to be given to any specialities that may be provided by the service — for example, mental health or dental services, as this would require specifically-trained staff for these functions.

Other organisational issues that should be considered relate to the need for tailored CDSS software to support the assessment and management of calls. A CDSS may require new resources to support its effective use; once implemented, CDSS software requires ongoing support and, potentially, innovations from the technology developers. Also, awareness or knowledge of a telephone service is likely to affect user uptake; publicity campaigns that educate the general public on the role that an

acute, non-urgent telephone line in Ireland serves and the appropriate use of this service would be important to maximise potential impact. Key features that should be highlighted for the general public include an easy-to-remember number, emphasis on fast triage, and advice on the correct care pathway.

The proposed acute, non-urgent telephone line is intended to support individuals navigate the healthcare system, as the available services are currently highly fragmented with limited connectivity. Such a telephone service would require close integration with existing services to avoid duplication and unnecessary use of resources. The provider of an acute, non-urgent telephone service would need to outline well-defined implementation steps, such as recruiting suitable staff, obtaining an appropriate CDSS system, obtaining premises from which this centralised national number will operate, and, most importantly, attempting to integrate and cooperate with existing primary care and urgent care services. It will be necessary to consult with stakeholders from other areas of the healthcare service who may be impacted by the introduction of this intervention such as primary care and urgent care services along with the general public. The performance of this service should be subject to ongoing monitoring and evaluation, to ensure the service is safe, effective, meeting needs and uses resources efficiently. In the event that a decision is made to introduce the telephone service, it is essential that any implementation in Ireland is accompanied by a robust, well-designed evaluation. The structure of the Irish healthcare system, with six Regional Health Areas, 20 Integrated Care Areas, and 96 Community Healthcare Networks, presents an opportunity to potentially pilot the service in selected areas and generate context-specific evidence. Such an approach may help to ensure that any long-term or national rollout is grounded in high-quality data, reducing the risk of inefficiency or duplication and guiding future decision-making.

6 Budget impact analysis

Key Points

- A budget impact analysis (BIA) was undertaken to estimate the costs of implementing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland.
- The analysis adopted the perspective of the Irish publicly-funded health and social care system, namely the Health Service Executive (HSE). Only direct medical costs to the HSE were estimated. The BIA projected costs over a five-year time horizon consistent with national guidelines.
- Costs included staffing, staff training and support, office set-up, hardware, software, public information campaign, and premises rent.
- It was assumed for the base case that the acute, non-urgent telephone service would be operational 24 hours a day, seven day a week and that call handling would be undertaken by non-clinical call handlers with support from nursing and other clinical (for example, doctors, dentists, pharmacists) call handlers where appropriate.
- The projected annual demand for an acute, non-urgent telephone service was derived from current service usage across various healthcare settings in Ireland. The projected annual demand for an acute, non-urgent telephone service is estimated to range from 270,000 (low demand) to 960,000 calls (high demand).
- The estimated five-year total budget impact of implementing a telephone service for acute, non-urgent medical care needs was estimated to range from €81.7 million to €254.2 million.
- The estimated average cost per call for a 24-hours-a-day, seven-days-a-week service staffed by non-clinical call handlers was €55.04 per call for the low-demand scenario and €48.15 per call for the high-demand scenario.
- Scenario analyses were conducted to examine the impact on the five-year total budget impact of altering the operational hours to an out-of-hours (OOH) service which would run from 6pm to 8am Monday to Friday and 24 hours a day on weekends and staffed by clinical call handlers.
- Low-demand scenarios: the base-case model was estimated to incur a five-year cost of €81.7 million.

  - Replacing non-clinical staff with clinical call handlers decreases the cost to €70.9 million. By staffing only clinical call handlers, all calls are handled directly, reducing the total workforce required.
  - The OOH model significantly reduces the budget impact. For non-clinical call handlers, the budget impact ranged from €37.7 million (120,000 calls) to €50.9 million (200,000 calls), corresponding to a 38% to 54% reduction in costs for an OOH service relative to a 24/7 service. If the OOH service is based on clinical call handlers, the estimated costs range from €34.5 million to €44.9 million.

- High-demand scenarios: The base-case model was estimated to incur a five-year cost of €254.2 million.
  - Replacing non-clinical staff with clinical call handlers decreases the cost to €217.0 million.
  - For an OOH service, costs range from €87.6 million (420,000 calls) to €135.2 million (710,000 calls) with non-clinical call handlers, which is a range of 47% to 66% reduction in costs for an OOH service relative to a 24/7 service. If the OOH service employed clinical call handlers, the costs decrease to €76.2 million to €117.1 million, respectively.
- Staffing costs were consistently identified as the dominant cost driver across all scenarios, accounting for between 72% and 82% of total costs.
- A limitation of this BIA was the high degree of uncertainty in relation to the projected call volumes underpinning the staffing estimates. These projections rely on assumptions about shifts in healthcare utilisation and the proportion of contacts transitioning from other services. Additional variability may arise from latent demand and supplier-induced demand.

6.1 Introduction

This chapter describes the budget impact analysis (BIA) undertaken to estimate the cost of implementing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland.

6.2 Methods

The analyses described in this chapter were conducted in line with national HTA guidelines[308] and were undertaken in Excel 2016.

6.2.1 Study objective

The purpose of this BIA was to estimate the potential financial cost of implementing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland.

6.2.2 Target Population

The target population for the telephone service includes individuals in Ireland who require acute, non-urgent medical care in the pre-hospital setting and may choose to use a telephone service. Estimating the potential demand for this service was challenging, as there is no easily identifiable group specifically using such a service. As detailed in Chapter 4, the projected annual demand for an acute, non-urgent telephone service was derived from current service usage across various healthcare settings in Ireland.

A key assumption for the model was that individuals who currently access general practitioner (GP) and primary care nurse services are unlikely to switch to the acute, non-urgent telephone service unless their care is primarily phone-based and does not require in-person consultation. For GP out-of-hours (OOH) services, where there were 1.1 million contacts in 2023, it was assumed that 5% to 15% of these calls might shift to the acute, non-urgent telephone service, primarily those not requiring face-to-face consultation. The demand from pharmacy consultations was also considered, based on data showing 4.6 million consultations annually (excluding vaccination consultations) in designated pharmacy consultation areas. The assumption was that between 1% and 10% of these consultations could shift to the acute, non-urgent telephone service. Annual call data for the National Ambulance Service (NAS) and Dublin Fire Brigade (DFB) were also examined, with an assumption that 4,000 to 8,000 calls to NAS and 2,000 to 3,500 calls to DFB could potentially use the acute, non-urgent telephone service. The model also took into account the 24,000 non-urgent emergency department (ED) cases in 2023, where individuals were both triaged as non-urgent and not admitted to hospital, with the assumption that 10,000 to 24,000 of these cases could also shift to the acute, non-urgent telephone service. Furthermore, the model considered that 3.6% of the Irish population reported unmet medical needs in 2022, with an estimated 150,000 to 300,000 additional calls anticipated from this group, representing a latent demand for healthcare services.

Based on these assumptions, the projected annual demand for an acute, non-urgent telephone service is estimated to range from 270,000 to 960,000 calls, assuming the service operates 24 hours a day, seven days a week. A range was presented rather than a point estimate for inferred demand due to the significant uncertainty surrounding the estimates and the inherent challenges in accurately predicting the number of individuals who would use the acute, non-urgent telephone service.

6.2.3 Study design

The focus was on estimating the implementation costs, as the purpose is to inform budget and resource planning. The model included costs relating to staffing, staff training and support, office set-up, hardware, software, a public information campaign, and premises rent for an office and call centre. As outlined in the international scoping review of the use and impact of acute, non-urgent telephone services (Chapter 3), the evidence for a positive impact on other health services (in terms of reduced primary care contacts, GP OOH services, ED presentations, and prevented ambulance call-outs) varied. Therefore, health benefits were not included in the analysis; moreover, a comparative evaluation of the costs and benefits, such as a cost-effectiveness analysis, was outside the scope of this HTA.

6.2.4 Perspective and time horizon

The analysis adopted the perspective of the Irish publicly-funded health and social care system, namely the Health Service Executive (HSE). Only direct costs to the HSE were considered, and where relevant, estimates were informed by the international scoping review (Chapter 3). Indirect costs such as out-of-pocket expenses incurred by individuals were not included in the model. Without a centralised cost register, parameter inputs and the underpinning model assumptions were heavily reliant on expert opinion. The time horizon represents the timeframe over which resource use is planned. In accordance with national HTA guidelines, the BIA was estimated on an annual basis over a five-year time horizon.

6.2.5 Model input parameters

Costs and resource use were estimated from a variety of published and unpublished sources including salary scales and quotes for equipment, supplemented by input from technical experts and HSE managers, where necessary. Value added tax (VAT) was included, where appropriate, in the BIA model. Discounting or depreciation were not applied, to reflect the actual expenditure by the HSE in each year reported. Given there is no similar Irish telephone service, parameter inputs and the underpinning model assumptions were heavily reliant on expert opinion and international data from existing acute, non-urgent telephone services.

6.2.6 Cost inputs

In accordance with national HTA guidelines, all costs are presented in 2024 euros (€). Costs included staffing, staff training and support, office set-up, hardware, software, public information campaign, and premises rent.

Staff Costs

The staffing roles were divided into four main categories:

- Clinical staff
  - Nursing staff: including staff nurses, senior staff nurses, and enhanced senior mental health nurses. These roles are responsible for providing clinical advice and ensuring appropriate care pathways for callers.
  - Other clinical staff: including senior house officers, pharmacists, and dentists. These roles provide specialised clinical input and support for complex cases.
- Non-clinical frontline staff
  - Call handlers: responsible for answering calls, assessing symptoms, and providing advice or directing callers to the most appropriate care.
  - Shift supervisors: these positions ensure the smooth operation of the service, including administrative support, data management, and overall service coordination.
- Business and administrative staff
  - Clerical and management staff: including roles from clerical officer grade to general manager and CEO.
  - Human resources (HR): essential for recruitment, training, and staff management.
  - Information and communications technology (ICT): ensures that the technical infrastructure is maintained and supports the service's operational needs.
  - Other administrative roles: includes clerical and managerial staff who handle finance, procurement, communications, quality and compliance, and general office management.

The number of whole-time-equivalent (WTE) staff members required for an acute, non-urgent telephone service operating 24/7 was estimated based on an average call length of 10 minutes,[309, 310] a utilisation rate of 70%, and three daily shifts, each lasting 7.5 hours. The estimates also included statutory annual leave and sick leave entitlements. Annual leave entitlements were calculated based on the HSE minimum entitlement of 22 days of annual leave and 10 public holidays,[311, 312]

resulting in a 12.3% adjustment. Sick leave was accounted for using the Central Statistics Office (CSO)-reported absence rate across all economic sectors in Q1 2023, which was 5.5%[313]. It was assumed for the base case that call handling would be undertaken by non-clinical call handlers, with support from nursing and other clinical (for example, doctors, dentists, pharmacists) call handlers where appropriate. The number of clinical call handlers required was based on data from NHS 111 England showing that 44% of all calls to NHS 111 from April 2023 to March 2024 required clinical input.[314]

The required WTE was calculated for both low- and high-demand of call volumes, assuming a 24/7 service.

- Low demand (270,000 calls annually) required the following WTEs (for a total of 153):
  - 91 non-clinical frontline staff
  - 28 nursing staff
  - 11 other clinical staff (for example, doctors, dentists, pharmacists)
  - 23 business and administrative staff.
- High demand (960,000 calls annually) required the following WTEs (for a total of 517):
  - 322 non-clinical frontline staff
  - 99 nursing staff
  - 38 other clinical staff
  - 58 business and administrative staff.

For estimation of staff unit costs, salary scales were identified from the Department of Health Consolidated Salary Scales applicable at the time of analysis (effective from 1 October 2024).[315] Salary costs were based on the mid-point of the scale and adjusted for pension, Pay Related Social Insurance (PRSI), superannuation and overheads (for example, office space, lighting and heating), in line with national HTA guidelines.[308] Staff costs are presented in Table 6.1 below. Costs related to board and non-executive board member remuneration were included, based on the HIQA expenditure for these roles in 2023.[316] Salary costs do not include any overtime staff costs. While the budget for the low-demand scenario included two WTE pharmacists and two WTE dentists, the primary demand for these professionals is expected to arise out-of-hours, given that they are typically accessible in-hours. In practice, this model would rely on a combination of part-time staff or an on-call roster to manage call-backs efficiently during evenings and weekends. Provision for interpreter services and social care workers was not included in the budget, as it is challenging to estimate the demand for these and therefore the level of staffing that would be required.

Table 6.1 Staff cost inputs

Parameter	Grade 1 on salary scale (€)	Unit cost (€)	WTE low demand (270,000 calls per annum)	WTE high demand (960,000 calls per annum)	Source
Nursing staff					
Staff nurse	35,919	70,063	22	78	
Senior staff nurse	56,407	87,515	4	14	
Mental health nurse	58,256	90,384	2	7	
Other clinical staff					
Senior house officer	52,614	95,714	7	26	
Pharmacist	47,995	94,918	2	6	
Dentist	56,533	97,234	2	6	
Non-clinical frontline					
Call handler	34,663	64,071	75	268	HSE Salary Scales[317]
Team lead (Grade V Clerical)	50,202	85,024	8	27	
Shift supervisor (Grade VI Clerical)	55,644	95,617	8	27	
Business and administration					
Clerical officer grade	29,810	58,267	1	1	
Grade IV (Clerical)	34,256	66,766	13	48	
Grade VIII (Clerical)	79,847	134,791	6	6	
General manager	83,233	142,768	2	2	
CEO band H2 hospitals	96,903	155,626	1	1	
Other salary costs in connection with remuneration of board and non-executive board members	N/A	93,430	1	1	HIQA[316]

Key: CEO – Chief Executive Officer; N/A – not applicable; WTE – whole-time equivalent.
Note: Unit costs were based on mid-point of the scale and adjusted for pension, Pay Related Social Insurance (PRSI) and overheads (for example, office space, lighting and heating).

Staff training

Staff training and support costs were estimated based on the 2023 HIQA annual report for annual expenditure on staff training and supports.[316] These training resources include providing ongoing professional development opportunities and implementing support systems (for example, mentorship and mental health resources).

Software and telecommunication costs

Software costs were calculated based on the Scottish NHS 111 telephone service software costs for software developments, annual licenses, and maintenance and telecommunication costs, as detailed in the NHS 24 Annual Report and Accounts 2022/2023.[265] Software costs were derived from the total reported expenditure of NHS 24 and calculated on a per-staff-member basis, aligning with the estimated WTE staffing levels required to handle projected call volumes. This approach ensures that the costs scale appropriately with the estimated staffing requirements for the proposed Irish service. The software costs were priced at €9,527 per staff member. While the NHS 24 Annual Report and Accounts does not provide specific details about the types of software included, it is likely to encompass essential systems for call handling, clinical decision support software (CDSS), case management, data security, and staff administration. Telecommunications costs were also adapted from NHS 24 data. These costs include expenses related to telephone systems, internet connectivity, and associated infrastructure to support a call service. Telecommunications costs were calculated at €2,144 per staff member. Economies of scale can play a role in software and telecommunication costs, particularly when adaptations to content and functionality are required. The cost estimates used in this analysis are based on data from Scotland, where a different provider operates within a distinct healthcare system. It is important to recognise that economies of scale may differ in an Irish context, potentially impacting overall software and telecommunication costs. Provision for teletype or text-based services was not included in the software costs due to challenges in estimating demand and associated costs. However, the inclusion of such services should be considered an essential component if the telephone line is implemented, to ensure accessibility and inclusivity.

Hardware costs

Hardware costs were included in the budget to account for the IT equipment necessary to operate the acute, non-urgent telephone service. These costs were estimated using quotes obtained from online retailers and include laptops, desktops, monitors, headsets, mice, keyboards, docking stations, conference room monitors

and printers. The hardware costs were calculated based on the following assumptions:

- The lifespan of laptops and desktops is approximately 40 months; as such, these devices will require replacement in Year 4.
- Laptops are assumed to be the primary device for non-call handler staff working both remotely and from the office, while desktops are allocated to call handlers working in office-based roles.

Office set-up costs

Office and call centre set-up costs were included to capture the initial investment required to establish the infrastructure for the acute, non-urgent telephone service. These costs were informed by consultation with a public sector facilities specialist with oversight of contracts, invoices, and quotes, ensuring realistic and accurate estimates. These costs covered essential components, including: desks, chairs, board table, filing cabinets, locker, storage cupboards, canteen tables, canteen chairs, meeting room chairs, meeting room table and furniture for breakout areas. The office and call centre set-up costs were calculated based on the expected scale of operations, including the number of WTE staff and the infrastructure needed to support both in-office and remote operations and scalability to accommodate fluctuations in call volumes.

Public information campaign costs

The cost of a public information campaign to promote the acute, non-urgent telephone service were included in the BIA. These estimates were obtained through discussions with the HSE Programme and Campaigns office, which oversees HSE public information campaigns.[318]

The campaign costs include a number activities and resources to ensure broad public awareness and engagement with the potential new service. The key components of the campaign are as follows:

- Foundational research. Research will inform the campaign strategy and test creative concepts. This includes focus groups, surveys, and analysis to identify effective communication approaches.
- Creative development and production. A creative strategy and related assets will be developed, informed by the foundational research. These assets may include audio visual (AV) materials, radio spots, digital content, and out-of-home advertising.

- Year one launch. Costs for a heavy media strategy to support the campaigns launch. Media channels will be selected based on research but are expected to include:
  - TV, radio, and digital advertisements
  - Social media campaigns and online videos
  - Out-of-home advertisements, such as billboards and transit ads.
- National door-to-door leaflet distribution. A tailored leaflet promoting the new service will be designed, printed, and delivered to all households in Ireland.
- Accessible formats and translations. Campaign materials will be produced in a range of accessible formats and languages.

Premises rental costs

Rental costs for premises to accommodate the call centre and office space for the acute, non-urgent telephone service were estimated based on the national average price per square metre reported by the Office of Public Works (OPW). The OPW's 2020 estimate of €285.90 per square metre[319] was adjusted to reflect inflation using the Consumer Price Index (CPI). The CPI provides a standardised measure of inflation and was applied to update the rental cost to 2024 prices, which were then used to inform the baseline costs. The required office space was determined by the projected WTE staffing levels for both low and high demand of call volumes. Based on these projections:

- Low demand (270,000 calls per annum): a total office space of 1,150 square metres was assumed to accommodate staff and operational needs.
- High demand (960,000 calls per annum): a larger office space of 3,500 square metres was assumed to support the significantly higher staff numbers and infrastructure.

While the OPW average price per square metre provides a useful benchmark, it represents a national average and does not account for regional variations in rental prices. Actual costs may vary significantly depending on the location of the premises within Ireland. Urban areas, particularly Dublin, are likely to have higher rental rates than rural or suburban locations.

6.2.7 Sensitivity analyses

To assess the potential demand on the acute, non-urgent telephone line if the service was limited to OOH operation, a sensitivity analysis was conducted. The OOH hours considered were from 6pm to 8am Monday to Friday, and 24 hours a day on weekends (Saturday and Sunday). Key assumptions were made based on the proportion of calls typically received outside regular working hours: 60% of calls to

the National Ambulance Service and Dublin Fire Brigade occur during OOH periods, while 33% of non-urgent attendances to the ED are made during these hours.[224, 232, 236] A sensitivity analysis examined the potential shift in demand from pharmacy consultations and individuals with unmet needs, assuming that between 30% and 70% of individuals from these groups may opt for the acute, non-urgent telephone line during OOH periods (Table 6.2). As there is high uncertainty surrounding the potential shift from pharmacy and those with unmet healthcare needs, a wide range from 30% to 70% was modelled.

Table 6.2 Parameter values used in the sensitivity analysis

Current service	Lower bound number of calls (n)	Upper bound number of calls (n)	Proportion to OOH acute, non-urgent telephone service (%)
GP (day time)	0	0	0
GP (OOH)	56,000	168,000	100
Primary care nurse	0	0	0
Pharmacy consultation	46,000	460,000	**30-70**
National Ambulance Service	4,000	8,000	60
Dublin Fire Brigade	2,000	3,500	60
Emergency department	10,000	24,000	33
Unmet demand	150,000	300,000	**30-70**

Key: GP – general practitioner; OOH – out-of-hours.

6.2.8 Scenario analyses

Scenario analyses were conducted to assess uncertainty in the model, whereby model assumptions and base case parameter values were varied. The purpose of these analyses was to evaluate how different factors, such as call volume, staffing configurations, and operating hours, could impact the budget for the acute, non-urgent telephone service. Ten distinct scenarios were considered, each focusing on varying one or more aspects of the call centre's operation. These scenarios included changes in the volume of calls, call centre operating hours and staffing levels (both clinical and non-clinical call handlers). If clinical call handlers are used, it reduces the total staff requirements by no longer needing the same levels of clinical staff available for call-backs. Scenarios were examined for 24-hour operation as well as an OOH service, which would run from 6pm to 8am Monday to Friday and 24 hours a day on weekends, as detailed in Table 6.3.

Table 6.3 Input parameters used in scenario analyses

Description of staffing	Call centre operating hours	Call volume low demand	Call volume high demand
Clinical call handlers	24 hours a day, 7 days a week	270,000	960,000
Non-clinical call handlers and clinical support staff	OOH Monday to Friday: 6pm to 8am Saturday and Sunday: 24 hours a day	120,000	420,000
		200,000	710,000
Clinical call handlers	OOH Monday to Friday: 6pm to 8am Saturday and Sunday: 24 hours a day	120,000	420,000
		200,000	710,000

Key: OOH – out-of-hours.

6.2.9 Quality assurance

The BIA was developed in accordance with national HTA guidelines, and quality assured in accordance with the HTA quality assurance framework. All model inputs and outputs were reviewed by a second member of the evaluation team.

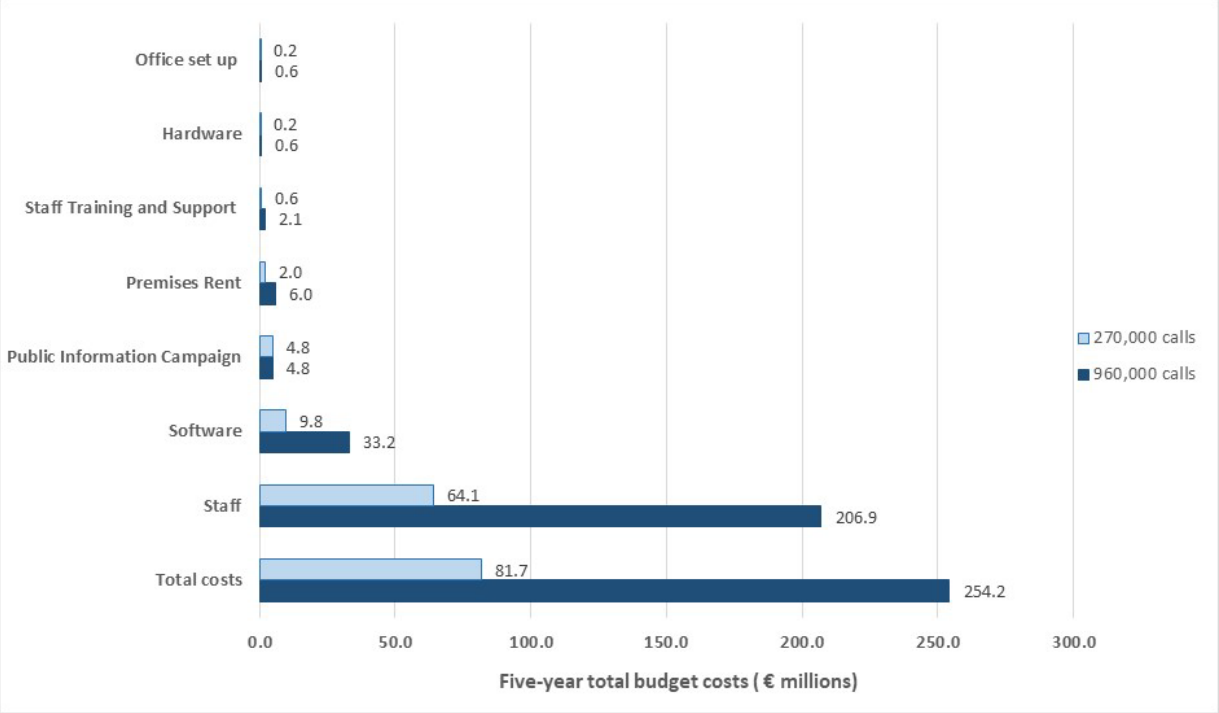
6.3 Results

6.3.1 Total budget impact

Over a five-year time horizon, the total budget impact of implementing a telephone service for acute, non-urgent medical care needs was estimated to range from €81.7 million to €254.2 million. These base-case estimates correspond to scenarios handling 270,000 and 960,000 calls per annum, respectively, by non-clinical call handlers for a 24-hour, seven-day-a-week service. Figure 6.1 illustrates the itemised total budget impact of implementing the acute, non-urgent telephone service over a five-year period for scenarios with annual call volumes of 270,000 and 960,000 calls. The majority of expenditure over a five-year period is attributable to staffing costs, which account for approximately 78% (€64.1 million) of the total cost in the low-demand scenario and 81% (€206.9 million) in the high-demand scenario. Software and telecommunication costs are the second-largest component, amounting to €9.8 million (12.0%) and €33.2 million (13.1%) of the total calls for the low-demand and high-demand scenarios, respectively. The remaining components (public information campaign, premises rent, staff training and support, hardware and office set-up) individually make a minor contribution to total budget impact. Collectively, these

components account for 9.6% of the total budget impact for the low-demand call scenario and 5.6% for the high-demand call scenario.

Figure 6.1 Itemised five-year total budget impact of the implementation of an acute, non-urgent telephone service



Detailed itemised budget for both call volume scenarios are presented in Table 6.4 and Table 6.5. The total estimated cost was €81.7 million for the low-demand scenario of 270,000 calls per annum, with annual expenditures increasing from €16.7 million in Year 1 to €17.3 million in Year 5. The total estimated cost was €254.2 million for the high-demand scenario of 960,000 calls per annum, with annual expenditures increasing from €48.6 million in Year 1 to €54.7 million in Year 5. An increase above the high-demand estimate of 100,000 calls per annum adds approximately €5 million to the annual budget impact.

- Staff costs: staffing was the largest cost driver, with staff numbers increasing annually to accommodate an estimated projected 5% growth in call volumes each year. This increase also impacted associated costs such as staff training and support, office set-up, software and telecommunications and premises rent.
- Office setup and hardware costs: office and call centre set-up costs were concentrated in Year 1, with a subsequent 10% upgrade required in Year 4. Hardware costs were similarly concentrated in Year 1, with replacements for laptops and desktops included in Year 4 due to their estimated 42-month

lifespan. Annual hardware costs increased yearly to account for additional staff each year.

- Software and telecommunications costs: software licensing costs were incurred annually and scaled by 5% each year to accommodate additional staff.
- Public information campaign: a significant investment was made in the first year to launch a comprehensive campaign, with maintenance costs in subsequent years allocated for evaluating and optimising media performance.
- Premises rent: rental costs remained stable over the five years due to long-term agreements, based on the OPW national average rental cost per square metre.

Table 6.4 Itemised budget impact of the implementation of an acute, non-urgent telephone service 24 hours a day, seven days a week with 270,000 annual calls (low-demand scenario staffed by non-clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	11,646,501	12,228,826	12,811,151	13,393,476	13,975,801	64,055,755
Hardware	120,481	6,024	6,024	61,247	6,024	199,800
Software and telecommunications	1,785,709	1,874,995	1,964,280	2,053,565	2,142,851	9,821,400
Office set up	195,897	0	0	19,590	0	215,487
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	114,550	120,277	126,005	131,732	137,459	630,023
Premises rent	393,146	393,146	393,146	393,146	393,146	1,965,730
Total	**16,696,284**	**15,223,268**	**15,900,606**	**16,652,756**	**17,255,281**	**81,728,195**

Table 6.5 Itemised budget impact of the implementation of an acute, non-urgent telephone service 24 hours a day, seven days a week with 960,000 annual calls (high-demand scenario) staffed by non-clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	37,618,884	39,499,828	41,380,772	43,261,717	45,142,661	206,903,862
Hardware	333,162	16,658	16,658	182,376	16,658	565,512
Software and telecommunications	6,034,063	6,335,766	6,637,469	6,939,172	7,240,875	33,187,345
Office set up	577,331	0	0	57,733	0	635,064
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	387,073	406,426	425,780	445,134	464,487	2,128,900
Premises rent	1,194,507	1,194,507	1,194,507	1,194,507	1,194,507	5,972,535
Total	**48,585,020**	**48,053,185**	**50,255,186**	**52,680,639**	**54,659,188**	**254,233,218**

6.3.2 Cost per call

Over a five-year period, incorporating a 5% annual increase in call volume, the total number of calls is projected to be 1,485,000 in the low-demand scenario and 5,280,000 in the high-demand scenario. The total budget impact over the same period is estimated at €81.7 million for the low-demand scenario and €254.2 million for the high-demand scenario.

Based on these figures, the estimated average cost per call for a 24-hours-a-day, seven-days-a-week service staffed by non-clinical call handlers is as follows:

- Low-demand scenario: €55.04 per call
- High-demand scenario: €48.15 per call.

A detailed breakdown of the cost per call for the first five years of operation is available in Appendix A Table A31.

6.3.3 Sensitivity analyses

Sensitivity analyses were conducted to assess the potential demand for the acute, non-urgent telephone line if the service were restricted to operating outside of regular working hours. The OOH hours analysed included 6pm to 8am on weekdays and 24-hour coverage on weekends. The analysis was informed by key assumptions regarding the proportion of calls and service interactions typically occurring during OOH periods, as well as potential demand shifts from other healthcare services and unmet needs.

The results of the sensitivity analysis provide an estimated range of inferred demand for the OOH service. The lower estimate suggests demand ranging from approximately 120,000 to 200,000 calls per year, while the upper estimates a range of approximately 420,000 to 710,000 calls per year.

6.3.4 Scenario analyses

Scenario analyses were undertaken to assess the impact on the five-year total budget of varying staffing grades from non-clinical call handlers (emergency call taker grade) to clinical call handlers (staff nurses) and operating hours to OOH (6pm to 8am Monday to Friday and 24 hours a day on Saturday and Sunday). Table 6.6 provides a summary of the five-year total budget for various scenarios. Detailed itemised costs for all scenarios are presented in Appendix A Table A19 to Table A30.

Low-demand scenarios (270,000 calls annually)

A 24/7 service staffed with non-clinical call handlers was estimated to incur a five-year cost of €81.7 million. Replacing non-clinical staff with clinical call handlers decreases the cost to €70.9 million. Using non-clinical call handlers would lead to higher overall staffing costs because additional clinical staff are needed to manage escalated calls. By staffing only clinical call handlers, all calls are handled directly, reducing the total workforce required.

The OOH model significantly reduces the budget impact. For non-clinical call handlers, the budget impact ranged from €37.7 million (120,000 calls) to €50.9 million (200,000 calls), corresponding to a 38% to 54% reduction in costs for an OOH service relative to a 24/7 service. If the OOH service is based on clinical call handlers, the estimated costs range from €34.5 million to €44.9 million (Table 6.6).

High-demand scenarios (960,000 calls annually)

A 24/7 service with non-clinical call handlers results in a five-year budget of €254.2 million. When clinical call handlers are used instead, the cost decreases to €217.0 million. For an OOH service, costs range from €87.6 million (420,000 calls) to €135.2 million (710,000 calls) with non-clinical call handlers, which represents a reduction in costs of 47% to 66% for an OOH service compared with a 24/7 service. If the OOH service employed clinical call handlers, the costs decrease to €76.2 million to €117.1 million, respectively (Table 6.6).

The cost per call for all scenarios modelled decreases as demand increases, reflecting economies of scale (Table 6.6). For the detailed breakdown of annual cost per call for all scenarios modelled see Appendix A Table A31.

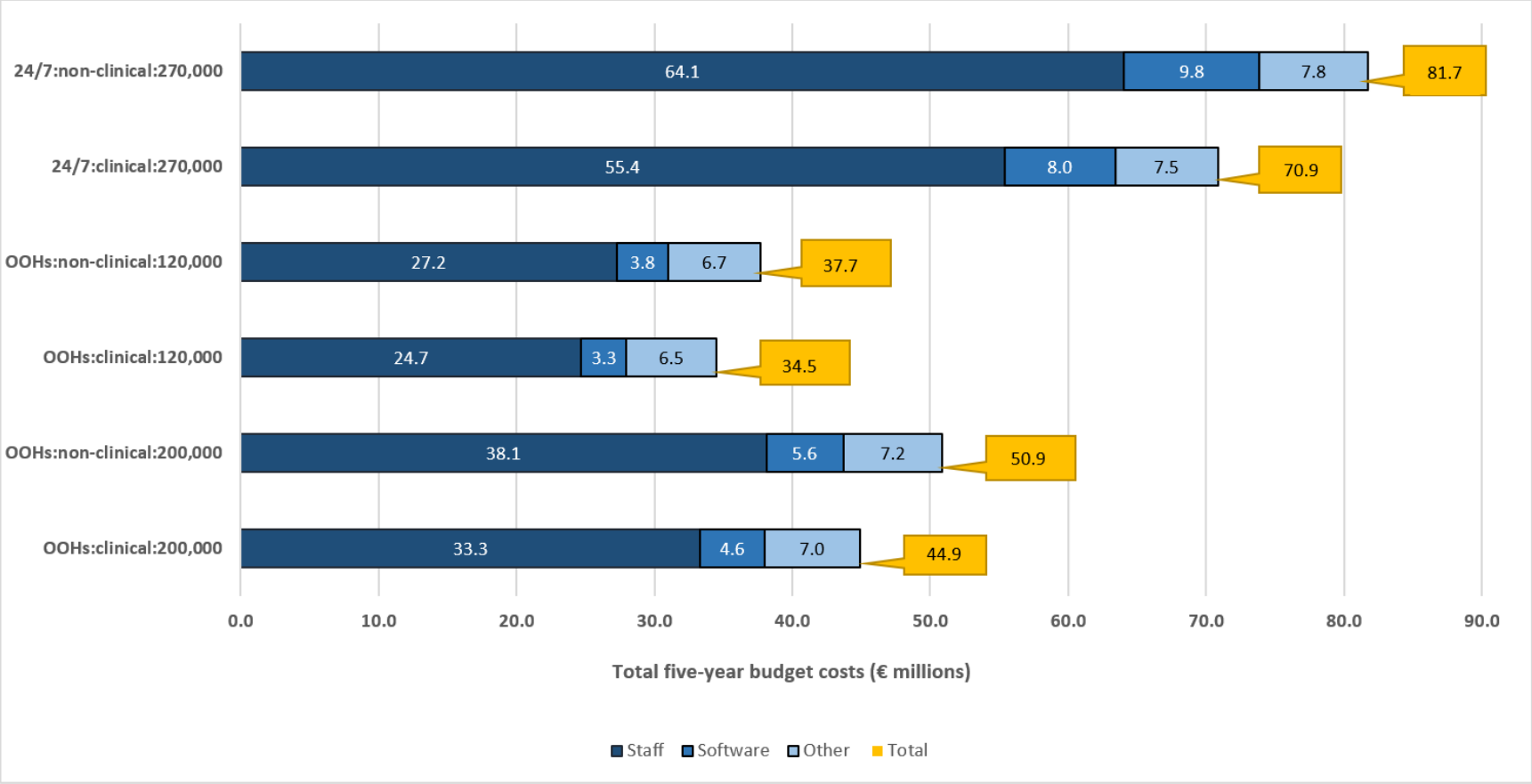
Table 6.6 Five-year total budget scenario analyses

Description of service	Annual call volume	Five-year total budget impact (€, millions)	Cost per call (€)
Low demand			
24/7 Non-clinical call handlers	270,000	81.7	55.04
24/7 Clinical call handlers	270,000	70.9	47.72
OOH Non-clinical call handlers	120,000	37.7	57.06
OOH Clinical call handlers	120,000	34.5	52.21
OOH Non-clinical call handlers	200,000	50.9	46.27
OOH Clinical call handlers	200,000	44.9	40.80
High demand			
24/7 Non-clinical call handlers	960,000	254.2	48.15
24/7 Clinical call handlers	960,000	217.0	41.10
OOH Non-clinical call handlers	420,000	87.6	37.91
OOH Clinical call handlers	420,000	76.2	32.98
OOH Non-clinical call handlers	710,000	135.2	34.63
OOH Clinical call handlers	710,000	117.1	30.00

Key: 24/7 – 24 hours a day, seven days a week; OOH – out-of-hours.

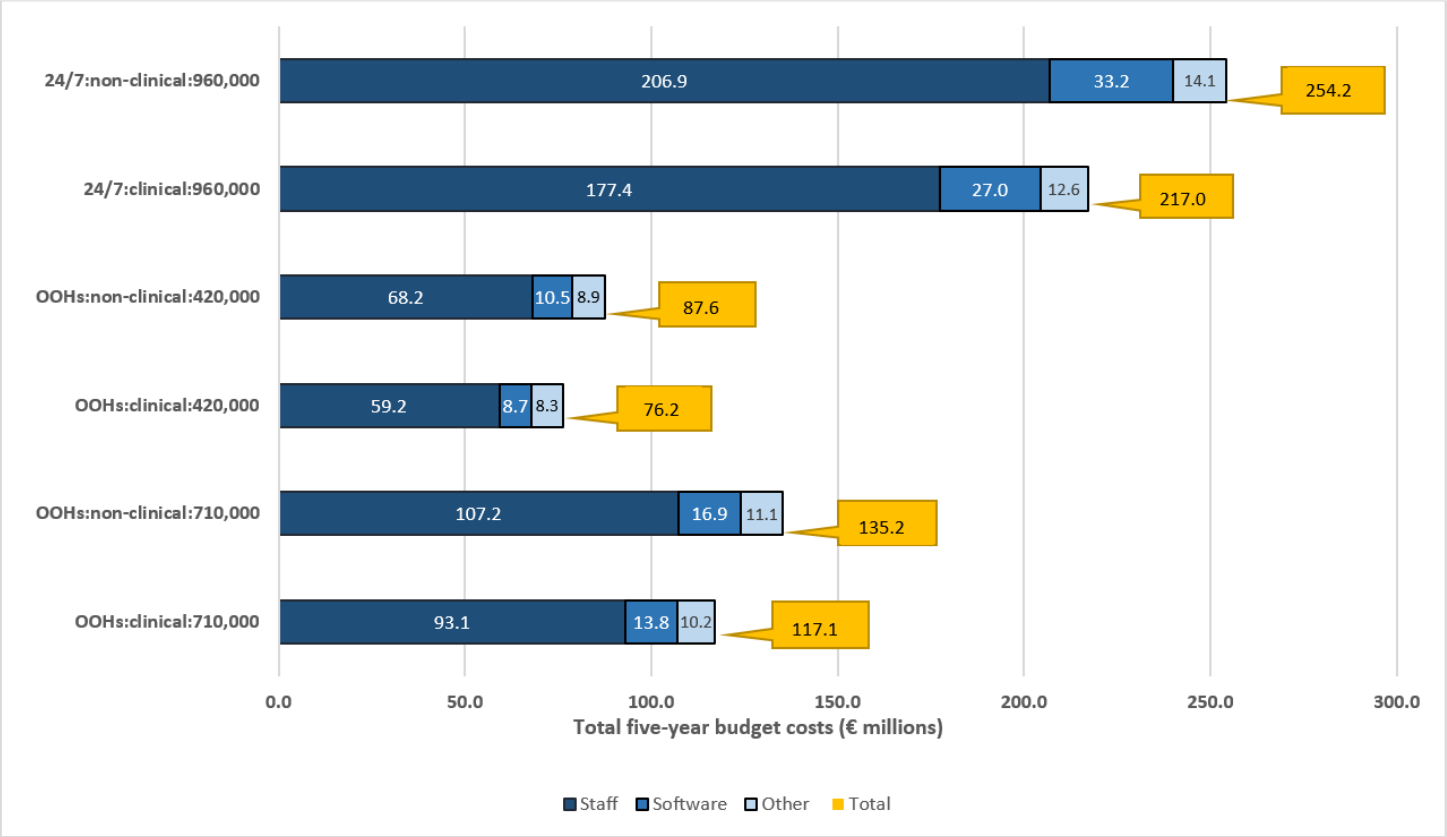
Figure 6.2 and Figure 6.3 illustrate the five-year total budget impact across scenarios for low- and high-demand projections, respectively. The majority of expenditure for these scenarios over a five-year period was attributed to staffing costs.

Figure 6.2 Five-year total budget impact of the low-demand scenario analyses examining the impact of altering staffing grades and operating hours



Key: 24/7 – 24 hours a day, seven days a week; non-clinical – non-clinical call handler; clinical – clinical call handler; OOH – out-of-hours. 'Other' includes hardware, public information campaign, office set up, and staff training costs.

Figure 6.3 Five-year total budget impact of the high-demand scenario analyses examining the impact of altering staffing grades and operating hours



Key: 24/7 – 24 hours a day, seven days a week; non-clinical – non-clinical call handler; clinical – clinical call handler; OOH – out-of-hours. 'Other' includes hardware, public information campaign, office set up, and staff training costs.

6.4 Discussion

The BIA presented provides an estimated cost range for implementing a telephone service for acute, non-urgent medical care needs in Ireland. Over a five-year time horizon, in the base-case analysis, the estimated costs ranged from €81.7 million for a low-demand service handling 270,000 calls annually to €254.2 million for a high-demand service handling 960,000 calls annually. However, it is important to emphasise the substantial uncertainty inherent in these estimates, stemming from assumptions of the projected service demand. Staffing costs were consistently identified as the dominant cost driver across all scenarios, accounting for between 72% and 82% of total costs. This is unsurprising given the labour-intensive nature of call centre operations, which require appropriately trained staff to manage large call volumes effectively. An increase in demand for the acute, non-urgent telephone service directly translates into higher costs. An additional 100,000 calls per year would increase the annual budget impact by approximately €5 million.

The projected annual 5% increase in call volumes and corresponding staff costs highlights the need for careful workforce planning to ensure scalability without compromising service quality. In the base-case analysis, additional specialist services such as pharmacists, dental professionals, and mental health nurses were included, ensuring that at least one professional in each role was available for call-backs. Despite their inclusion, the overall staff budget estimates remained largely unaffected. This suggests that integrating additional specialist roles into the service may be feasible without substantially increasing the financial projections. The inclusion of basic-grade dentists and pharmacists in the budget impact model reflects a pragmatic approach to estimating staffing costs. However, the demand for a new service of this nature is inherently unpredictable, making it challenging to determine the optimal staff grades needed to effectively address caller queries. If senior-grade pharmacists and dentists were required, this would lead to a modest increase in costs, with a 1.3% and 1.4% rise in the five-year total budget for a low-demand and high-demand service, respectively. These potential cost variations highlight the uncertainty surrounding service requirements and the need for flexibility in workforce planning as demand patterns emerge. Additionally, consideration should be given to funding additional roles such as social workers and translators to ensure the service is accessible and responsive to the needs of the population.

The BIA also highlights the significant upfront investments in hardware, software, office set-up and the public information campaign. Although these costs were one-off or periodic, their impact on the overall budget was considerable, particularly in year one. Such investments are essential for service establishment and public

awareness, but should be planned with clear long-term objectives to maximise cost efficiencies. A more unified approach that integrates this acute, non-urgent telephone service with existing resources (for example, HSE Live, the HSE health app and HSE.ie) could help the public better understand the range of available services and when to use each one. Ensuring clear communication about service pathways may help manage demand effectively and direct individuals to the most appropriate care. Additionally, if a broader public awareness campaign were undertaken, some of the associated costs could be distributed across multiple services, potentially reducing the financial burden associated with this new telephone service alone.

The scalability of the service shows costs increasing predictably with call volume, but demonstrates efficiencies at higher volumes. These efficiencies arise from the dispersal of fixed costs across a larger number of calls, highlighting the economic advantages of scale. Beyond the direct costs, the societal impact of implementing the service must also be considered. Individuals may incur expenses depending on the advice given. For example, if they are advised to visit a GP, they will bear the cost of the appointment. While some may face these additional costs, others may not.

In the base-case analysis, the cost per call was calculated at €55.04 per call for a low-demand scenario and €48.15 per call for a high-demand scenario. Differences across scenarios in the cost per call demonstrate a clear economy of scale, where increased call volumes contribute to reduced per-call costs. There is substantial variability across Denmark, Sweden, England, and Scotland in the cost per call, with estimates ranging from €9.14 to €51.01 (see Chapter 3). This variability is likely influenced by differences in service design, including factors such as the types of call handlers employed and the hours of operation. However, it is important to note that these cost estimates were collected at different time points, which may affect comparability. The cost per call was estimated at €12.27 in Denmark (2016), €9.14 in Sweden (2008), and between €13.36 and €14.37 in England (2010/11 and 2021). In Scotland, the estimated cost per call was substantially higher at €51.01 (2005). Without detailed information on the specific design and cost structures of these services, it has not been possible to determine how some countries have achieved significantly lower call costs than those estimated for Ireland or those reported for NHS 24 in Scotland.

The scenario analyses highlight the financial trade-offs associated with staffing grades and operational schedules. While use of clinical call handlers may provide qualitative benefits and their inclusion results in cost decreases, there would likely be significant recruitment challenges due to workforce shortages. It is important to note

that recruitment challenges could also arise for non-clinical call handlers. The analysis of operating hours revealed that limiting the service to OOH operations reduced costs by 38% to 54% for the low-demand scenario and by 47% to 66% for a high-demand scenario compared with a 24/7 model. While this approach offers significant cost reductions, it will limit accessibility for individuals requiring non-urgent medical care during daytime hours. While a 24/7 model ensures maximal accessibility, the OOH-only scenarios demonstrate the potential for significantly lower costs without fully compromising service availability. A hybrid approach, combining initial OOH implementation with gradual scaling to full 24/7 coverage, may offer an alternative solution. A major unknown is the scale and timing of unmet demand. Without clear data on when individuals most need such a service, it is difficult to predict whether an OOH model would be sufficient to capture the majority of this demand. If unmet need is flexible, meaning individuals are willing to wait until the service is available, then an OOH service may be adequate. However, if demand is more immediate, gaps in availability could limit the service's impact and shift demand elsewhere in the healthcare system.

Extending the service's function or integrating it with existing healthcare pathways could improve efficiencies by leveraging these fixed costs across a broader range of operations. For example, if the acute, non-urgent telephone service was integrated into an existing service such as NAS, certain fixed costs, such as premises rent, could potentially be subsumed. This integration could enhance efficiency by leveraging existing infrastructure and administrative support. The choice of call centre location must balance the cost and availability of suitable premises with access to a skilled workforce. If the service primarily relies on non-clinical operators, there may be greater flexibility in selecting a location, potentially allowing for lower-cost options. However, if a predominantly clinical workforce is required, the call centre would likely need to be based in a main urban centre, where rental costs may be higher for both the organisation and its employees. If there was a substantial growth in demand for the acute, non-urgent telephone service, it may ultimately require a move to a larger premises or establishing a second call centre. The call centre and office space costs were estimated on a pro rata basis, assuming that additional staff would require proportional increases in space. However, as office size increases, there may be opportunities for greater space efficiency; therefore, actual office costs may be lower than estimated if space can be used more efficiently. These factors should be carefully considered when planning the service to ensure both operational and cost efficiencies.

The financial trade-offs highlighted in this analysis have significant policy implications. Decisions regarding staffing models, operating hours, and service scalability must align with broader healthcare priorities, such as equity, access, and

patient satisfaction. For example, while an OOH model may cost less, it could limit access for patients with non-urgent needs during regular hours. Similarly, use of clinical call handlers could enhance service quality, but contribute to HSE workforce recruitment challenges for frontline clinical staff.

Several limitations must be acknowledged with these analyses. The projected call volumes underpinning the staffing estimates are inherently uncertain. These projections were derived from inferred shifts in healthcare utilisation patterns, such as assumptions about the proportion of contacts with GP OOH, emergency services, pharmacy consultations, and ED visits that could transition to the new service. Additionally, latent demand from individuals with unmet medical needs introduces additional variability. Supplier-induced demand is another important consideration, as greater awareness of the service may lead individuals to use it who might not have otherwise sought care. Given the absence of a comparable service in Ireland, reliance on international benchmarks introduces a degree of speculation. Consequently, actual call volumes may vary substantially, which would directly impact staffing requirements and therefore also office space, hardware, software, and other associated costs. As outlined in the international scoping review on the use and impact of acute, non-urgent telephone services (Chapter 3), evidence regarding their positive impact on other health services was inconsistent. As a result, any potential cost offsets were not included in the analysis.

7 Patient, social, ethical and legal considerations

Key points

- A telephone service for acute, non-urgent medical care needs in the pre-hospital setting could offer benefits and support to individuals who have difficulty accessing healthcare services currently, by providing free advice and guidance without appointment or the need to travel.
- This technology will potentially result in directing people to use healthcare services who would otherwise have delayed or foregone care in the absence of the phone line. Currently in both primary care and emergency departments (EDs), demand exceeds capacity. Without provision of additional resources in these settings, there is a risk that the acute, non-urgent telephone service could create additional challenges in meeting demand, leading to frustration for service users and providers.
- The absence of a shared electronic health record is a risk to the individual; this absence may also pose a risk to the wider health service. Introducing an additional layer to the health system could exacerbate issues of inefficiency, duplication, and unnecessary use of resources, particularly in Ireland, given the fragmented and disconnected nature of existing services.
- Decisions about healthcare distribution should ensure that resources are allocated or reallocated fairly, and that the opportunity costs (the value of the next best alternative forgone) of new investments are considered. This may prove difficult as there may be many competing claims requiring prioritisation of care. Funding interventions that do not represent an efficient use of resources can create issues of justice and equity with respect to a fair distribution of benefits and burdens. The high costs and potential for shifting demand rather than reducing it must be carefully weighed against the expected benefits, especially in the context of a finite healthcare budget.
- If the acute, non-urgent telephone service is integrated into the functions of an existing organisation, an amendment to legislation could be required. If the service is set up as an independent organisation, new legislation would likely be required.

7.1 Introduction

This chapter discusses the patient and social considerations, and ethical and legal issues that should be considered in relation to providing a telephone service for acute, non-urgent medical care needs in the pre-hospital setting in Ireland. This chapter was broadly developed in line with the structure described in the European network of HTA (EUnetHTA) Core Model.

7.2 Patient and social considerations

This section outlines the potential benefits and harms at an individual and societal level, as well as the public expectations and perceptions of an acute, non-urgent telephone service.

Benefits

Geographical location is a known factor determining access to out-of-hours (OOH) and emergency care, as identified in Chapter 3.[148] Non-urgent visits to emergency departments (EDs) can also arise where OOH services are less accessible than an ED.[8, 194] Long distances between rural or remote residences and health services may serve as a barrier in terms of cost, time, and inconvenience. Within this context, an acute, non-urgent telephone service may improve timely access to health advice. However, that advice may often be to seek an in-person medical consultation (for example, from a GP), and in those cases, those living remotely will continue to have issues with access. The location of the caller, and what services are available locally, should be considered in any advice given to the caller. To facilitate this, the service would require access to an up-to-date directory of healthcare providers, including their locations, contact details, and opening hours. While maintaining accurate information for HSE-run services should be relatively straightforward, it would be more challenging for independently-operated providers such as GP practices, where hours may vary and availability can change frequently. Up-to-date pharmacy opening hours are publicly available through the website of the Pharmaceutical Society of Ireland, which could support more accurate and timely signposting to community pharmacy services. In the absence of reliable, real-time information, callers may receive only general advice, which could limit the utility of the service as one of its key benefits would be providing callers with practical and actionable guidance.

Chapter 3 described the findings of an international review to assess the evidence for the impact of acute, non-urgent telephone services on health outcomes and healthcare delivery. The international review found that callers reported a consistently high level of satisfaction with the acute, non-urgent telephone service.

However, satisfaction was affected by call waiting times, perceived quality of communication, caller expectations, and agreement with the advice received. As outlined in Chapter 3, international estimates vary as to the proportion of callers who receive self-care advice, ranging from 7% to 51%. Given the variability in the international estimates, the likely impact on Irish face-to-face consultations is unknown. For those living remotely or with limited mobility, receiving self-care advice remotely would have a notable benefit over travelling for the same advice in person. However, as shown in Chapter 4, rural and remote populations have highlighted the lack of consideration of their communities in service delivery across countries, with poor access to in-hours and OOH primary care. If the advice from the telephone service to a person living remotely is to seek a primary care appointment as soon as possible, this may lead to frustration when primary care services are not readily available.

The existence of an acute, non-urgent telephone service may also provide comfort to vulnerable populations, such as elderly living alone. Knowing that non-urgent medical advice from trained operators is just a phone call away could provide reassurance and peace of mind.

At present, those seeking free non-urgent medical advice have multiple options, including consulting a pharmacist, visiting the HSE website for guidance on medicines and common conditions, or searching for information online. However, reliance on online searches could lead to suboptimal or even harmful self-management decisions. The volume of online non-official health information available, some of it unreliable, means that individuals may struggle to determine the best course of action for their specific health concerns. An acute, non-urgent telephone service would offer tailored advice based on the individual's symptoms and medical history, ensuring that callers receive guidance that aligns with best medical practice. This personalised approach may lead to accessing care at a more appropriate health service and potentially better management of care for the individual. As seen in Chapter 3, the ability to provide a personalised approach can be facilitated if the operator has access to the patient's electronic medical records. The National Shared Care Record, expected to begin rollout at the end of 2025, could enable more tailored care if effectively integrated with the acute, non-urgent telephone service. Evidence from the international review suggests high levels of compliance with triage advice. This suggests that those who have not yet contacted primary care services may be more likely to seek an appointment with a GP after receiving advice to this effect from a service within the health system.

Harms

The introduction of an easy-to-remember three-digit number for a telephone service could result in people calling it by mistake instead of calling 112/999. This could slow the response time in an emergency situation and place a burden on NEOC. The system must be designed so that the transfer of calls between 112/999 services and an acute, non-urgent telephone service would be seamless in both directions.

In the absence of a fully-integrated healthcare system with full linkage of health data, advice given to the caller would be based only on the information they provide during the call, with no physical examination or access to the caller's medical history. However, the planned rollout of the National Shared Care Record at the end of 2025 could help address this limitation by enabling access to relevant clinical information. Symptoms may be poorly described or misunderstood, leading to inappropriate advice or delayed treatment. Patients may also feel uncertain or anxious if they perceive that their care is fragmented or if they have to repeatedly explain their situation to different providers. For calls requiring a clinician call-back, there may be a requirement for the caller to restate aspects captured during their initial call. Some degree of repetition may be unavoidable in such cases. There is also potential for confusion among callers to the telephone service, as members of the public may have difficulty distinguishing between acute, non-urgent medical care needs and conditions that require urgent or emergency attention. This challenge is compounded by the fact that symptoms can overlap, making it harder for individuals to determine the most appropriate service to contact. This lack of clarity could result in underutilisation or inappropriate use of the telephone service.

In the context of acute, non-urgent telephone triage services, appropriateness refers to whether or not the caller receives suitable advice to address their health concern. Advising the caller to seek the appropriate care could potentially save resources. Over-triage (that is, referral to a higher level of care than is needed) could lead to overuse of the healthcare system, while under-triage (advice or referral to a lower intensity of care than is needed) could result in safety issues for the patient. As detailed in Chapter 3, the international evidence showed that 0.8% to 18% were considered to have been under-triaged and 5% to 22% were over-triaged. International evidence on the safety of acute, non-urgent telephone services was also examined in Chapter 3 — referring to the protection of callers from harm as a result of using the service. Harms can include those due to delay, error, unplanned attendance at the ED and unplanned hospital admissions after being given a lower level of care advice or being under-triaged. On average, under 10% of calls had any safety concerns. Unintended incidents refer to occurrence of adverse events in connection with the advice given through the telephone triage service. Countries

included in the review reported low numbers of unintended incidents, with others reporting low numbers of malpractice claims relating to the advice that was given. Given that this service is intended for non-urgent issues, even a relatively small proportion of safety concerns highlights the importance of continuous audit and review processes to ensure patient safety. Regular monitoring and evaluation will be essential to identify potential risks, improve triage accuracy, and maintain high standards of care. Additionally, while prioritising patient safety, the service must also aim to minimise over-triage, ensuring that individuals are directed to the most appropriate level of care without unnecessary escalation.

For those who are not registered with a GP, the acute, non-urgent telephone service may provide them with timely access to personal healthcare advice, which can include clinician call back. However, this may depend on the advice that is provided. Additionally, it is unclear what proportion of the population are not registered with a GP. Estimates from the international literature of the proportion of callers to acute, non-urgent telephone services advised to visit their GP varies, ranging from 9% to 69%. However, it may not be possible for those who are not registered with a GP to comply with this advice, likely leading to frustration for both the call operator and caller. In some instances, callers may be able to access primary care through OOH services without being registered with a GP; however, this is likely to incur a cost and travel burden. The aim of the acute, non-urgent telephone service is to ensure that people enter the health system at the most appropriate point for their healthcare needs. This is contingent on sufficient capacity at the most appropriate point in the system. If an acute, non-urgent telephone service were to be established, consideration would need to be given to what advice should be given to those who are not registered with a GP, when the clinical decision support system (CDSS) suggests that a visit to the GP would be the most appropriate course of action. This would require collaboration with other sectors of the health service.

The quality of advice provided could vary depending on the training and experience of the call handlers. Inconsistent advice may lead to confusion and potentially harmful outcomes for patients. However, this risk can be mitigated by providing training (as outlined in Chapter 5) and ensuring that all staff adhere to the advice prompted by the CDSS software. The advice output from the CDSS software is reliant on the information obtained by the call handler, and therefore eliciting appropriate information would be an important part of training.

With the provision of a free telephone advice service, some individuals may come to use the telephone service in preference to regular in-person check-ups and consultations with their GP. This could complicate patient management in a system without linked medical records, as GPs would not have documentation of advice

given to the individual by the phone service. Frequent use might be more likely for individuals who live remotely, have mobility issues, or otherwise face challenges in accessing non-urgent medical care. However, the review of international literature did not find definitive evidence of an impact of an acute, non-urgent telephone service on attendance in primary care.

7.2.1 Benefits and harms at a population level

Benefits

The introduction of an acute, non-urgent telephone service could potentially enhance the general population's understanding of health issues and appropriate care pathways. This would work in tandem with signposting to the HSE's website where they can find information about self-care for certain medical concerns (Chapter 5). This could empower individuals to make informed health decisions. Additionally, increased knowledge of appropriate care pathways could contribute to better healthcare utilisation, ensuring individuals seek care in the most appropriate healthcare settings. This may potentially reduce the incidence of preventable conditions, supporting early intervention and encouraging healthier behaviours over time.

An acute, non-urgent telephone service could be used by those caring for others including children and the elderly. Considering the caller demographics of acute, non-urgent telephone services internationally, while the largest user subgroup of callers is those aged 20-65 years (50%), the services are frequently used by people aged 0-20 years (35%), with most of these calls in relation to those aged one to four years; those aged 65 years and older comprise 15% of callers. These proportions largely reflect the age distribution of the population, and suggest that calls are made by and for people of all ages, reflecting a wide spectrum of possible medical issues. As noted, the international review also suggests high levels of service satisfaction and compliance with the advice provided, suggesting that acute, non-urgent telephone services provide a source of support and reassurance for carers, particularly in cases where accessing a GP or ED could be challenging.

Those whose first language is not English maybe struggle with accessing healthcare services. From a resource perspective, while it may be challenging to provide interpreter services at a local level, this may be more feasible with an acute, non-urgent telephone service given that it would be provided on a national basis. Therefore, an acute, non-urgent telephone service could improve access to and engagement with healthcare services for those whose first language is not English.

The impact of introducing an acute, non-urgent telephone service must be considered in terms of the effect it may have upon other health system stakeholders such as primary care and OOH services, EDs, and ambulance services. International evidence (Chapter 3) suggests that callers largely follow the advice received. Unless a call is closed with self-care advice, the main effect may be a shift in resource use among different healthcare settings. By diverting non-urgent cases away from EDs and GPs, the telephone line could help to alleviate the burden on these services. This ensures that resources are available for more urgent and critical cases, potentially improving overall healthcare efficiency. An acute, non-urgent telephone line may alleviate the burden on EDs and ambulance services by triaging non-urgent cases; however, international evidence on this is conflicting (Chapter 3).

Depending on the extent of and need for record-keeping, the data collected through the telephone service could be used to support monitoring public health trends and identifying emerging health issues. This could potentially support timely public health interventions and contribute to overall population health management. This new data source could augment the data already captured in primary care through the sentinel GP surveillance project[320] to give a broader picture of emerging health issues.

Harms

As outlined in Section 7.2, the absence of a shared electronic health record is a risk to the individual; this absence may also pose a risk to the wider health service. In the current health system, there is no linked electronic record to show which services a person has consulted or availed of before they present at a new point in the healthcare system — for example, primary care and ED records are not linked. Adding another layer to the health system may compound issues of inefficiency, duplication, and unnecessary use of resources, particularly in the Irish context given the fragmented and disconnected nature of existing services.

Telephone services are typically not as accessible to those facing language barriers, those who are deaf or hard of hearing, or those with speech impediments. Access to the emergency service telephone line (999/112) for those who are deaf, hard of hearing or speech impaired is currently facilitated by text message. However, incorporating a text message service for a telephone service would involve a considerable extra set-up burden. An online system, which could be available to all, may be more appropriate (Chapter 5). If steps are not taken to manage access for those who are deaf, hard of hearing or those with a speech impairment or language barriers, existing health disparities could be exacerbated.

All countries that have implemented an acute, non-urgent telephone service have seen an increase in calls over time (Chapter 3). It is unclear if increased demand is due purely to changes in population numbers and age distribution, or whether acceptability and uptake of the service are increasing. As highlighted in the budget impact analysis in Chapter 6, an acute, non-urgent telephone service is very resource-intensive to deliver. Individuals may find talking through an issue with a call handler is preferable to navigating an online alternative, such as HSE Live, which is less resource-intensive to deliver. If an acute, non-urgent telephone service was introduced, it would be important to educate the public about not just the new service but also the various other information sources available. Additionally, some services including primary care and EDs are currently operating at capacity, with demand often exceeding capacity (Chapter 2). As the international evidence shows that an acute, non-urgent telephone line would often refer people to GP services, if there is no capacity in that setting, then the telephone line would be unable to fulfil its purpose, and frustration with the health service would likely grow.

There is a risk to the individual in being reliant on telephone advice. At a population level, this could lead to decreased quality of care and health overall, particularly for those with conditions that require physical examination and personal interaction. That said, many users of this service are likely to currently have unmet healthcare needs rather than representing a shift away from in-person care. Those with limited access to GP services would likely be most susceptible to developing a reliance on advice given through the telephone service. However, the international evidence review showed that compliance with advice was strong, which suggests that those with the means to attend a GP or ED will do so if advised by the call taker.

7.2.2 Perceptions, expectations and acceptance of an acute, non-urgent telephone service

Evidence from the international review in Chapter 3 highlighted that call volumes have increased over time in all countries that have implemented an acute, non-urgent telephone service. As outlined in Chapter 5, measures would be required to manage public expectations and boost awareness around any acute, non-urgent telephone service in order to support changes in behaviour. Any public awareness campaign should increase the awareness of the telephone number; however, if people become very familiar with the service, they maybe get used to calling this number and neglect to call 112/999 when it would be more appropriate. If emergency calls are repeatedly held up in the acute, non-urgent telephone service in error, this may damage trust in the service.

In addition to increasing awareness of the telephone service itself, any public information campaign must also clarify how this service fits within the broader

healthcare ecosystem, particularly in relation to existing online and phone-based services. The introduction of a new service could inadvertently add to public confusion about where to seek advice, given the overlap with other services such as the HSE Health App and HSE Live. A well-structured campaign should clearly communicate the purpose of each service, helping individuals understand when to use the acute, non-urgent telephone service versus other healthcare options. Without this clarity, there is a risk of creating a new layer of complexity, where people are uncertain about which service to contact, potentially leading to inefficiencies and inappropriate healthcare utilisation. By ensuring that the different services are clearly signposted, the public can be guided toward the most suitable option for their healthcare needs.

The public would also need to have trust in the provider, with regard to the collection and storage of any personal data. While there is a risk of data breaches or misuse of sensitive information, which could undermine trust in the service, it is expected that minimal identifiable data would be collected in an unlinked service. A CDSS would require a series of questions to be asked before advice and guidance can be provided, which may seem intrusive for some people. These people may prefer to only contact their local providers, with whom they have built up a relationship. Call takers should make it clear to the caller that the information is sought to give the most appropriate advice, and they should provide reassurance about data protection.

7.3 Ethical considerations

Overall, healthcare policies and national governance frameworks which relate to the ethical issues of healthcare provision would likely be applicable to a telephone service for acute, non-urgent medical care needs. Internationally, telephone services operate under overarching strategic and ethical frameworks for healthcare — for example, 'A matter of Life: Strategic Framework for the Capital Region of Denmark'[321] in Copenhagen and the 'Integrated urgent care service specification' in England.[170] An organisation may also consider developing an internal ethical framework such as Scotland's NHS Values and Behaviours Framework.[322] The framework includes expected behaviours which demonstrate each of the NHS 24 values of: Care and Compassion; Dignity and Respect; Openness, Honesty, and Responsibility; Quality and Teamwork. In the subsequent sections, ethical considerations for the Irish context are outlined.

7.3.1 Autonomy

It is expected that the autonomy of the individual would not be affected by the introduction of this service. Use of the telephone service would be entirely voluntary

and it would not act as a gatekeeper for accessing healthcare services. For example, if the outcome of a call was advice for self-care, that would not preclude the caller from contacting their GP or attending an emergency department. Callers would receive guidance on what is the most appropriate action for them to take, based on the information they provide. However, they would be free to determine their own course of action. An acute, non-urgent telephone service would be underpinned by a CDSS. In an unlinked healthcare system, a CDSS can only provide guidance and support based on the information provided by the caller. It is possible that the advice may differ from that which would be provided by, for example, an individual's GP, who is familiar with their medical history. This conflict could undermine the autonomy of the clinician to provide medical advice. Stakeholders in healthcare services should be involved in reviewing the types of advice that can be given to callers, to ensure that it is consistent with available pathways, guidelines, and access to services.

7.3.2 Privacy and confidentiality

Steps should be taken to ensure General Data Protection Regulation (GDPR) requirements are met. This would be similar to the requirements for other telephone lines such as the emergency telephone service (999/112). Calls would likely be recorded for safety, quality, and medico-legal purposes. Reassurance can be provided to the caller that their personal information will be confidential.

7.3.3 Justice and equity

It is possible that if a telephone service for acute, non-urgent medical needs were introduced, it would lead to a shift in resource use among different healthcare settings. It is unclear from this assessment in which direction resource use would shift. Implementation may also be accompanied by an increase in overall resource use for the healthcare services in general as people perceive the health system to be more accessible as a result of this new service being introduced.

As noted in Chapter 5, implementation of an acute, non-urgent telephone service could lead to workforce expansion, with more staff being employed and additional roles created. The health sector in Ireland is currently experiencing staff shortages, and services face significant resourcing challenges.[323] Introduction of an acute, non-urgent telephone service may worsen existing resource challenges in the health system. It is likely that many of the staff needed for this acute, non-urgent telephone service would move from another section of the health service. Hiring embargoes would also have an impact on recruitment to this service.

As outlined in Section 7.2 and in Chapter 5, some people would be more likely to use the service than others. Provision of an acute, non-urgent telephone service may ease inequities in some circumstances. However, some people, including those who are deaf, hard of hearing, or those with speech impediments or language barriers, may face challenges in availing of the service, depending on how it is designed and implemented. Existing telephone-only services such as GP OOHs are currently inaccessible to many in the Deaf community. To ensure the service does not create or exacerbate inequities, it should be designed to be inclusive and accessible for the entire population. This would include accessible communication options from the outset, such as text-based, email, or video-calling platforms with access to Irish Sign Language (ISL) interpretation.

Ireland does not have universal healthcare, with charges made at the point of access to the healthcare system. While people with limited means may be eligible for a medical card or GP visit care, for some cost remains as a barrier to accessing treatment. For those with limited means, it may not be financially possible to comply with advice to attend the ED or GP. Additionally, rural populations might not have easy access to an ED. While these inequities in access are likely to persist, an acute, non-urgent telephone service could help reduce the burden of travel by providing self-care advice in some cases, potentially preventing unnecessary GP or ED visits. However, there is also the possibility that the service may direct individuals to seek in-person care when they might have otherwise done nothing. If this results in more timely treatment, it could lead to improved health outcomes, making travel worthwhile. The impact of the service will depend on whether it tends to over-triage or under-triage; if over-triage occurs, it may increase the number of healthcare visits rather than reduce them.

The results of the international review show that the available evidence does not provide definitive answers to questions about the optimal design of an acute, non-urgent telephone service or the impact on health outcomes and healthcare delivery. The technology would also be associated with a large budget impact (Chapter 6). Allocating funding to a less efficient service could divert resources away from areas where they may be more effectively used. However, while the efficiency of such an investment is uncertain, the service may help address some of the significant challenges people face in accessing primary care.

7.3.4 Ethical consequences of the HTA

At present in Ireland, primary care and emergency care services are under a significant amount of pressure due to capacity constraints. Any intervention that could potentially increase this pressure could have wide-ranging negative consequences for delivery of healthcare.

The evidence collected in this HTA is based on a telephone service only; developments in web-based platforms and artificial intelligence could change the impact of a telephone service for acute, non-urgent care needs. Currently, Ireland lacks a centralised national system of electronic healthcare records, which contributes to several of the organisational challenges outlined in Chapter 5. The planned rollout of the National Shared Care Record at the end of 2025 could partially address this limitation by providing access to relevant clinical information and supporting more integrated care delivery.

As outlined in Chapter 6, there are limitations to the projected demand estimates that informed the budget impact analysis. There is substantial uncertainty in the projected call volumes that inform staffing estimates. These projections were derived from inferred shifts in healthcare utilisation patterns, such as assumptions about the proportion of contacts with GP OOH, emergency services, pharmacy consultations, and ED visits that could transition to the new service. Unmet medical needs may also be an important contributor, adding further variability due to the lack of evidence on the scale of this latent demand. Supplier-induced demand is another key factor, as increased awareness of the service could lead individuals to use it who might not have otherwise sought care. As a consequence, actual call volumes may vary substantially, which would directly impact staffing requirements and therefore office space, hardware, software, and other associated costs.

7.4 Legislation

Consideration should be given to whether legislation would be needed to underpin the functions of a new telephone service. If the service is integrated into the functions of an existing organisation, an amendment to legislation could be required. If the service is set up as an independent organisation, legislation would likely be required. This was the case when NHS 24 was set up in Scotland, where it was set up as a special Health Board under Section 2 of the National Health Service (Scotland) Act 1978. [324]

In Ireland, NAS was set up under the Health Act (1970). NAS operates with a moral duty of care for each caller. Pre-Hospital Emergency Care Council (PHECC) registrants follow the PHECC Code of Professional Conduct & Ethics.[325] HSE health and social service providers also follow a code of conduct: 'Supporting a Culture of Safety, Quality and Kindness: A Code of Conduct for Health and Social Service Providers'.[326]

Consideration would need to be given to the liability associated with providing advice and guidance. In Scotland, a contingent liability is included in the annual account for

NHS 24 clinical and medical compensation payments.[265] A CDSS could be designed to be risk adverse, to reduce the risk of liability. However, the more risk adverse the CDSS is designed to be, the more likely it is to over-triage and escalate the need to see a healthcare professional. Call operator responses should be monitored and evaluated to ensure that they are consistent with the recommended advice generated by the CDSS.

7.5 Discussion

This chapter considered the patient, social, ethical, and legal issues that might arise with the introduction of a telephone service for acute, non-urgent medical care needs in the pre-hospital setting. In terms of the benefit-harm balance, consideration would need to be given to the potential for the harms of the telephone service to outweigh the benefits. The service could offer benefits and support to individuals who have difficulty accessing healthcare services currently, by providing advice and guidance without an appointment or the need to travel. This technology aims to support the timely provision of care in the most appropriate setting. However, this is contingent on appropriate resources being available in all settings. Currently both primary care and EDs have a demand-capacity gap, which may be exacerbated by introduction of an acute, non-urgent telephone service. Advice to attend these services without an increase in capacity in these settings could ultimately have a negative impact on the availability of face-to-face services such as primary care and EDs. The introduction of a new telephone service may add to public confusion due to overlaps with existing online and phone-based services. Clear communication about each service's role is essential to prevent uncertainty, inefficiencies, and inappropriate healthcare use. A well-structured public information campaign should clearly distinguish among different services, helping the public understand when to use the acute, non-urgent telephone service instead of other healthcare options.

Autonomy and privacy considerations largely align with those of existing services and so existing procedures could be adapted for the establishment of an acute, non-urgent telephone service. However, consideration would need to be given to ensuring the autonomy of healthcare providers, by ensuring that the design and outputs of the CSSD comply with current guidelines, protocols and or clinical expertise.

Justice and equity considerations relate to a finite budget for a health service that currently has significant capacity constraints. Introduction of an acute, non-urgent telephone service could lead to movement of staff away from frontline services, which would lead to further capacity difficulties. The results of the international

review show that the available evidence does not provide definitive answers to questions about the optimal design of an acute, non-urgent telephone service, the effectiveness of the service, and the impact on health outcomes and healthcare delivery. The technology would also be associated with a large budget impact. This significant financial investment and possibility of redistributing demand rather than reducing it must be carefully weighed against the expected benefits, especially in the context of a constrained healthcare budget.

The absence of a shared electronic health record is a risk to the individual; this absence may also pose a risk to the wider health service. Adding another layer to the health system may compound issues of inefficiency, duplication, and unnecessary use of resources, particularly in the Irish context where the available services are currently highly fragmented with limited integration. If steps are not taken to manage access for those who are deaf, hard of hearing or those with a speech impairment or language barriers, existing health disparities could be exacerbated. Decisions about healthcare distribution should ensure that resources are allocated or reallocated fairly, and that the opportunity costs of new investments are considered. This may prove difficult as there may be many competing claims requiring prioritisation of care. Funding interventions that do not represent good value for money could create issues of justice and equity with respect to a fair distribution of benefits and burdens. Decisions on staffing models, operating hours, and service scalability must be guided by broader healthcare priorities, including equity, accessibility, and patient satisfaction. These factors must be carefully balanced to ensure the service effectively meets public needs while remaining sustainable and efficient.

8 Discussion

8.1 Introduction

A health technology assessment (HTA) is intended to support evidence-based decision-making with regard to the most efficient use of resources in the healthcare system. The aim of this HTA was to assess the requirements for the provision of a national telephone service, distinct from the 112/999 emergency service, for acute, non-urgent medical care needs in the pre-hospital setting.

Within the context of the pre-hospital setting, acute, non-urgent care needs are defined as medical care needs where the investigation or intervention for an injury or illness could be safely deferred or where the care needs could be managed in a setting other than the emergency department (ED) or by contacting emergency services. These alternative healthcare settings include primary care or other community-based services. For individuals seeking healthcare, it may be difficult for them to distinguish between medical care needs that require urgent medical attention, and those that are acute, but non-urgent. Currently in Ireland, people have a range of options to access publicly-funded healthcare, including: through their (GP) during office hours or ringing GP OOH services, self-presenting at an injury unit, self-presenting at an ED, or ringing 112/999 emergency ambulance services. People also have the option to visit a community pharmacy where they can obtain advice, receive treatment for a minor illness, or be redirected to other primary care or urgent care services.

When primary care services and injury units cannot be readily accessed, people with acute, non-urgent medical care needs who wish to access healthcare, but who are unwilling or unable to wait, must either self-present to EDs or call the emergency services contact number to be managed by emergency ambulance personnel in order to access healthcare. This has contributed to increased burden on emergency services and EDs. Under the current pathway, there may also be people who require urgent care, but who defer attending the ED as they do not think this level of care is necessary or because they expect long waiting times. The reason people contact emergency services or self-present at EDs where use of an alternative service might be more appropriate is multifaceted, driven by both individual and systemic factors. Factors such as access, awareness of other healthcare services, patient's self-assessment of illness severity, and confidence in the quality of care in EDs are significant contributors. Currently in Ireland, demand is surpassing capacity in primary care, emergency care, and social healthcare services (for example, community care, public health nurse), with data indicating that demand for these services is continuing to rise.

An acute, non-urgent telephone service in Ireland would operate as a triage system in the pre-hospital setting. It would involve trained operators taking calls from people who believe they have an acute non-urgent medical care need. The call operators would provide telephone triage and redirect callers to the most appropriate healthcare setting based on their described symptoms. In some cases, a call may conclude with the operator providing advice and guidance without the need for further referral. Provision of an acute, non-urgent telephone service is intended to support the timely provision of care in the most appropriate setting.

8.2 Summary and context of key findings of the Health Technology Assessment

Acute, non-urgent telephone services are an increasingly prevalent feature of healthcare delivery internationally. At present, a telephone service for acute, non-urgent medical care needs has been implemented in 22 OECD countries, with the first service operational since 1998. The rationale for implementing an acute, non-urgent telephone service is broadly similar across countries — that is, to reduce ED attendance, and to improve access to timely assistance and appropriate care. However, it is noted that each of these countries is unique in terms of the existing healthcare system in which the service has been implemented, the maturity of the telephone service, and the level of analysis conducted with respect to the its impact.

A scoping review of international practice was completed as part of this HTA. The review focused on acute, non-urgent telephone services implemented in Denmark, Sweden, England, Scotland, and Australia. There are several key similarities among Ireland's healthcare system and those of the countries considered in the scoping review. For example, each country has a healthcare system that is predominantly publicly funded, in which a significant portion of healthcare services is financed through taxation or government funding. Each of these countries also report facing similar healthcare challenges, including rising demand and increasing pressure for urgent care services, ageing populations, and the need to improve access to timely assistance and appropriate care. However, there are also key differences among the healthcare systems of these countries, such as variations in funding mechanisms, healthcare delivery models, and governance structures. It is also notable that Denmark, Sweden, England, Scotland, and Australia all have a well-established national patient identifier, which allows access to patient medical records across a variety of settings.

Considering who is using the acute, non-urgent telephone services, the international evidence shows that callers are slightly more likely to be female. They are typically calling for themselves, as a parent or carer on behalf of a child, or as a carer for an

older adult or dependent adult. Calls are made by or on behalf of people of all ages, covering a wide range of issues and levels of support needed. In the paediatric population, the most represented caller group is carers of one- to four-year-olds. In terms of how the acute, non-urgent telephone services are used, approximately one third of callers report using the service as they did not know what course of action to take, while a quarter report using this service as an alternative to calling their GP. Less than 20% of callers report having the original intention to call an ambulance or attend an ED. The reason for calling the acute, non-urgent telephone service is more frequently reported as due to illness rather than injury. In England and Scotland, where NHS 111 and NHS 24 services operate 24 hours a day, call volumes are considerably higher outside of normal office hours, with 82% to 90% of calls being made in the out-of-hours period. The results also show that while triage disposition varied across studies, across all age groups, the most common advice given to callers is to visit their GP (9% to 69%), followed by advice to attend the ED (5% to 49%), or they receive self-care advice (7% to 51%).

The available international evidence does not provide definitive answers to questions about the optimal design of an acute, non-urgent telephone service, the effectiveness of the service, and or the impact on health outcomes and healthcare delivery. This is because the services vary in their aims, reflecting differences in healthcare systems, population needs, and service provision across countries. However, it does highlight key considerations that would have cost and resource-use implications and which would likely impact the anticipated demand for such a service in Ireland. This technology aims to support the timely provision of care in the most appropriate setting. However, this is contingent on appropriate resources being available in all settings. Unless a call is closed with self-care advice, the outcome of a call may be a shift in resource use among different healthcare settings. Advising people to attend a service without an increase in capacity in that setting could result in service strain and delays in accessing care. Moreover, it is recognised that there is a potential for an acute, non-urgent telephone service to create supplier-induced demand, which could further compound existing demand-capacity gaps. The impact of introducing an acute, non-urgent telephone service in Ireland must therefore be considered in terms of the effect it may have upon other health system stakeholders such as primary care and OOH services, EDs and ambulance services. Successful integration of an acute, non-urgent telephone service in Ireland would require engagement with existing services to enable mutual understanding and trusting relationships. A comprehensive understanding of the existing care pathways and the interactions between these health services and the acute, non-urgent telephone service is needed, as some reorganisation within these existing services may be

required in order to minimise duplication of assessment and to improve system efficiency and patient experience.

Introduction of an acute, non-urgent telephone service has the potential to free up healthcare resources such as ambulance or ED capacity. However, in the context of finite healthcare budget, consideration would need to be given as to whether the development of an acute, non-urgent telephone service in Ireland would be an efficient use of resources. Notably, it was beyond the scope of the analysis to consider how implementation of this service would compare with other interventions aiming to reduce ED visits and ensure timely delivery of appropriate care, such as improving access to primary care or OOH services. Decisions about healthcare distribution should ensure that resources are allocated or reallocated fairly and that the opportunity costs (the value of the next best alternative forgone) of new investments are considered. Considering the included international evidence, it was not possible to directly compare costs across services due to differences in the acute, non-urgent telephone services being delivered, the costing methodologies employed, the types of costs included, and the maturity of the telephone service at the time of analysis. However, the available evidence shows that reported savings resulting from resource reallocation do not cover the cost associated with implementing the acute, non-urgent telephone service.

The international evidence shows that establishing and providing an acute, non-urgent telephone service is associated with annual costs ranging from €1.8 million for a regional service covering 423,000 individuals to €119 million for a mature national service covering 5.5 million individuals, depending on the services provided. In terms of costs associated with establishing such a service in Ireland, from the perspective of the HSE, the estimated five-year incremental budget impact for a 24/7 service is expected to range from €81.7 million for a low-demand service handling 270,000 calls annually to €254.2 million for a high-demand service handling 960,000 calls annually. This equates to an average cost per call of approximately €55 for a low-demand scenario and €48 for a high-demand scenario. However, it is important to emphasise the substantial uncertainty inherent in these estimates, stemming from assumptions regarding the projected service demand. In particular, there is a challenge estimating the extent of unmet demand for acute, non-urgent care. This HTA assumed that there is likely to be substantial unmet demand, but also potential induced demand; that is, individuals may use the service who would not otherwise have sought care. Given the high cost per call, induced demand could have major budgetary implications. Additional data collection, for example a public survey, may provide useful evidence on the likely uptake of the service. This could help refine service design and staffing levels while managing costs efficiently. A key takeaway from the international evidence is that acute, non-urgent telephone

services tend to experience increasing demand over time. If demand substantially exceeds capacity, there is a high risk of service strain and inefficiencies, potentially undermining the intended benefits of the service.

In terms of the design of an acute, non-urgent telephone service in Ireland, consideration would also have to be given to whether the service is operated by non-clinical, trained call operators answering and triaging calls, and or by a clinically-trained workforce. Of note, the literature highlights that employing a non-clinical workforce to manage calls does not necessary lead to reduction in the overall cost of the service or an improvement in staff recruitment or retention. In the budget impact analysis, staffing costs were consistently identified as the dominant cost driver across all scenarios, accounting for between 72% and 82% of total costs. The overall budget impact is highly dependent on staff numbers, which in turn are driven by service demand. Additionally, recruitment challenges may affect staffing availability and costs, influencing the feasibility of service expansion or scaling.

Another key consideration in the staffing of an acute, non-urgent telephone service is whether the service would operate 24/7 or at specific times only, such as evenings and weekends. This would have implications for rostering of staff given the need to ensure adequate numbers of operators are available to meet demand during busy time periods. Not having the service available 24/7 might create gaps in service delivery and confusion among members of the general public as to when the acute, non-urgent telephone service number is available. If an acute, non-urgent telephone service were to be introduced in Ireland, consideration would also have to be given to any specialities that may be provided by the service — for example, mental health or dental services — as this would require specifically-trained staff for these functions. The scenario analyses conducted in the budget impact analysis highlight the financial trade-offs associated with staffing grades and operational schedules. While use of clinical call handlers may provide qualitative benefits and their inclusion decreases the cost of the service, there are likely to be significant recruitment challenges. The analysis of operating hours showed that compared with a full 24/7 model, limiting the service to OOH operations would reduce costs by 38% to 54% for the low-demand scenario and by 47% to 66% for a high-demand scenario. While this approach would lower the cost of implementing the service, it must be considered in the context of limited accessibility for individuals requiring non-urgent care during daytime hours.

The results of the budget impact analysis also highlight the requirement for significant upfront investment in hardware, software, office set up and the public information campaign. Such investments would be essential for service establishment and public awareness, but would need to be planned with clear long-

term objectives to ensure efficient use of resources. Awareness or knowledge of an acute, non-urgent telephone service is likely to affect user uptake. Adding to the ecosystem of non-urgent care services that currently exist in Ireland without a very clear purpose that is easily distinguishable from existing services might create confusion. This would affect both the efficiency and the potential demand for an acute, non-urgent telephone service. Publicity campaigns that educate the general public on the role that an acute, non-urgent telephone service in Ireland serves, and the appropriate use of this service, would be important to maximise potential impact. Key features that should be highlighted for the general public include an easy-to-remember number, emphasis on fast triage, and advice on the correct care pathway.

Given the significant budget impact associated with implementing the acute, non-urgent telephone service, further research would be valuable to better understand potential demand and inform its design. Conducting a public survey or similar research could provide insights into how individuals might use the service, what types of queries they would seek assistance with, and whether certain population groups would be more likely to engage with it. This information would be crucial for refining the service specification, ensuring it meets public needs effectively, and enables the efficient use of resources. Importantly, since the overall budget is directly tied to call volume, higher demand will lead to an increased total cost. Understanding potential call volumes in advance would help policy-makers anticipate budget requirements and ensure that appropriate funding and staffing levels are in place. If a decision is made to proceed with implementation, such research could help optimise resource allocation and minimise the risk of over- or underestimating demand.

A key motivation for considering the introduction of this service is to guide individuals to the most appropriate point of entry within the healthcare system based on their specific medical needs. However, this telephone service will exist within a broader ecosystem of online and telephone-based services, with some overlap in purpose and utility from a patient's perspective. The intended use is for individuals with acute, non-urgent care needs. However, because callers must self-determine which service to use, and given the potential appeal of accessing a free consultation with a clinician, there is a risk of high demand from individuals who could be adequately served by existing resources such as HSE Live or HSE.ie. If there is also an intention that an acute, non-urgent telephone service would support people with limited access to primary care, this might influence how the service is resourced and structured, including, for example, whether or not non-clinical or clinical staff are used as call operators and whether video calling should be enabled. Clearly defining the purpose of the service is critical to its design and evaluation. The intended objectives could include improving access to care, reducing inappropriate ED and GP

visits, and providing a point of entry for individuals without primary care access. Without a clear goal, assessing the success or efficiency of the service would be challenging.

8.3 Strengths and limitations

The findings of this assessment should be considered in light of its overall strengths and limitations. Firstly, a robust approach to the assessment was employed with publication of a protocol for the HTA, and conduct of the assessment in accordance with national HTA guidelines. An Expert Advisory Group (EAG) comprising a broad range of key stakeholders was established to support the assessment, and stakeholders outside of EAG members were consulted to ensure the perspectives of those impacted by the current pathway and the proposed acute, non-urgent telephone service were appropriately represented in the assessment.

A key limitation of the international scoping review presented in Chapter 3 was that it was not possible to pool outcome data, as the acute, non-urgent telephone service models and outcomes assessed differed substantially across countries and studies. Furthermore, while every effort was made to provide a comprehensive overview of the acute, non-urgent telephone services considered in this scoping review, and the wider healthcare systems within which these services operate, it is not possible to capture all the contextual information that is needed to fully understand both the service and each country's healthcare system. This lack of contextual information leads to difficulties when considering the outcomes of interest considered by each country. Limited safety data were identified in the included studies, with substantial variability among studies. The proportion of calls that were considered to have been under-triaged (that is, received advice or referral to a lower level of care than was needed) ranged from 0.8% to 18%. It is unclear from the data whether under-triage results in adverse outcomes for callers; this would depend on the context and whether the caller follows the advice provided. While over-triage (that is, received advice or referral to a higher level of care than was needed) is less of a concern from a safety perspective, high levels of over-triage could indicate an overly cautious approach and result in an inefficient use of resources. Data on over-triage were also limited and inconsistent, with reported over-triaging ranging from 5% to 22%. Under-triage and over-triage pose risks to both callers and the healthcare system, making ongoing monitoring and evaluation of the service important.

Lastly, the projected call volumes underpinning the staffing estimates in the budget impact analysis presented in Chapter 6 are inherently uncertain. These projections were derived from inferred shifts in healthcare utilisation patterns, such as assumptions about the proportion of contacts with GP OOHs, emergency services,

pharmacy consultations, and ED visits that could transition to an acute, non-urgent telephone service. In addition to this, latent demand from individuals with unmet medical needs introduces additional variability. Given the absence of a comparable service in Ireland, reliance on international benchmarks introduces a degree of speculation. Consequently, actual call volumes may vary substantially, which would directly impact staffing requirements and therefore also office space, hardware, software, and other associated costs.

8.4 Conclusions

Telephone services for non-urgent medical care are becoming increasingly common across OECD countries, with 22 nations implementing such services. They aim typically to reduce ED visits and to provide timely, appropriate care. A scoping review of services in Denmark, Sweden, England, Scotland, and Australia highlighted similarities with Ireland's healthcare system, such as public funding and challenges like rising demand and ageing populations. These countries, however, differ in their funding models, healthcare delivery, and governance. Common user demographics include females and caregivers, with the majority of calls coming from those aged 20-65 years. Users typically call for advice on managing illness rather than injury, and most calls are made outside of regular office hours. While these services have the potential to improve timely and appropriate access of care, the design and impact of these services on health outcomes and resource use remain unclear, particularly in terms of shifting demand among healthcare settings without necessarily reducing overall healthcare resource utilisation.

Implementing an acute, non-urgent telephone service in Ireland would require careful consideration of several design features, including staffing, operational hours, and integration with existing services. Staffing costs are the primary financial driver, with limited opportunity to reduce the cost of the service due to alternative staffing models, such as use of non-clinical operators instead of clinical operators to handle calls. Importantly, if a clinically-led model is pursued, the requirement for clinical staff would be significant, many of whom are already in short supply across the health system. These trade-offs must be carefully considered, particularly in the context of existing workforce constraints and competing demands on healthcare resources. Across scenario analyses, estimated five-year budget impact analysis ranged from €34.5 million to €254.2 million, depending differing assumptions regarding demand, staffing configurations and operating hours, highlighting the financial implications of its introduction. Operational models that limit service hours to evenings and weekends could reduce the cost of delivering the service, but may limit accessibility for non-urgent care during the day.

While an acute, non-urgent telephone service could improve access to care and reduce pressure on EDs, its success in Ireland would depend on effective integration with existing services, clear public communication, and managing the financial and resource implications. Ensuring the service is targeted toward acute, non-urgent medical needs rather than general health inquiries is critical to avoiding unnecessary costs and service congestion. The high costs and potential for shifting demand rather than reducing it would need to be carefully weighed against the expected benefits, especially in the context of finite healthcare budgets. The proposed telephone line is intended to support individuals navigate the healthcare system, as the available services are currently highly fragmented with limited connectivity. Such a telephone service would require close integration with existing services to avoid duplication and unnecessary use of resources.

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Table A1. Acute, non-urgent telephone service options internationally

OECD Country	Out-of-Hours Primary Care†	Acute, non-urgent telephone service	National / Regional	Triage staff	Other information
Australia[8, 41, 68]	Practice based Hospital ED* GPC Deputising	Healthdirect help line (1800 022 222). Established in 2006. Healthdirect digital platforms include an application and a website for symptom checking and service finding.	National with the exception of Queensland. National	Nurses	A call advice summary is offered by SMS with a link to a personalised webpage for additional information. A telephone or video call back may be offered to those advised to see a GP within 24 hours.
Austria[8, 38, 40]	Practice based Hospital ED* Rota	Healthcare help line (1450). Established in 2017.	National	Nurses	
Belgium[8, 38, 42]	Rota PCC	Telephone Triage System (1733). Established in 2008.	National	Trained operators*	
Canada[8, 43, 69]	Practice based Hospital ED	HealthLink (811). Established in 2005.	National	Nurses	
Chile[8]	PCC	No acute, non-urgent telephone service available			
Colombia	NR	No acute, non-urgent telephone service available			
Costa Rica	NR	No acute, non-urgent telephone service available			
Czech Republic[8, 38]	Hospital ED* PCC	No acute, non-urgent telephone service available			
Denmark[8, 70] (44)	GPC	Medical Helpline (1813). Established 2014.	Regional	Doctors and nurses	Text message service available for hearing-impaired individuals.
Estonia[8, 46]	Practice based Hospital ED	Family Doctor Advice line (1220). Established 2005.	National	Doctors and nurses	
Finland[8, 38, 47]	PCC Hospital ED*	The Medical Helpline (116 117). Established 2019. Medical Helpline online service provides a service directory and an online chat service is in development.	National with the exception of Lapland and the Åland Islands.	Healthcare professional	
France[8, 71]	Rota Hospital ED	No acute, non-urgent telephone service available			

OECD Country	Out-of-Hours Primary Care†	Acute, non-urgent telephone service	National / Regional	Triage staff	Other information
Germany[8, 72] [48]	Rota	Telephone help line (116 117). Established 2012. Online service for booking appointment.	National	Medically-trained staff*	Doctors or allied health professionals do not require a referral. A specialist appointment can be booked with a referral code from doctor.
Greece[8]	Practice based Hospital ED	No acute, non-urgent telephone service available			
Hungary[8, 38, 51]	Practice based PCC	Healthline (1812). Established 2019. Online service provides health information and service information.	National	Contact centre staff*	
Iceland[8, 50]	Rota Hospital ED	Telephone consultation of primary care nurses (5131700). Heilsuvera: a public website which provides reliable knowledge on health and wellbeing and health promotion.	National	Nurses	
Ireland[38]	Rota GPC	No acute, non-urgent telephone service available			
Israel[8, 73]	PCC Hospital ED	No acute, non-urgent telephone service available			
Italy[8, 49, 74]	PCC	Non-urgent medical assistance line (116 117). Established in 2013. Online service for virtual doctor's consultation.	National	Non-clinical trained call operator	
Japan[8, 52, 75, 76]	PCC Hospital ED*	Telephone triage service (7119). Established in 2007 in Tokyo and 2009 in Osaka and Nara prefectures.	National	Nurse	Triage nurse uses a software to determine the urgency of the client for each symptom and process necessary services.
Republic of Korea	NR	No acute, non-urgent telephone service available			
Latvia[56]	NR	General Practitioners' Advice line (66016001).Online service	National	Doctors	
Lithuania	NR	No acute, non-urgent telephone service available			
Luxembourg[8, 38]	PCC	No acute, non-urgent telephone service available			

OECD Country	Out-of-Hours Primary Care†	Acute, non-urgent telephone service	National / Regional	Triage staff	Other information
Mexico[8]	Practice based Hospital ED	No acute, non-urgent telephone service available			
The Netherlands[8, 77]	GPC	No acute, non-urgent telephone service available			
New Zealand[57, 78]	Practice based	Healthline (0800 611 116). Established in 2005. Online service available for health information and advice from health professionals.	National	Nurses	Healthline staff may request an image or video of condition from caller.
Norway[8, 59, 79]	GPC PCC	Out-of-hours medical services telephone line (116 117). Established in 2010. Helsenorge is the official website for information about and access to health services in Norway.	National	Nurses	
Poland[8, 38]	PCC	No acute, non-urgent telephone service available			
Portugal[53, 80]	PCC	Telephone line called SNS 24: (0808242424). Established in 2017. SNS 24 website offers symptom checker and advice for non-emergency health problems.	National	Doctors and nurses	
Slovak Republic[8, 38]	Practice based GPC	No acute, non-urgent telephone service available			
Slovenia[8, 38]	Rota Hospital ED	No acute, non-urgent telephone service available			
Spain[8, 38]	Rota PCC	No acute, non-urgent telephone service available			
Sweden[8, 55, 81]	GPC PCC	National medical help line (1177). Established in 2003. 1177 website provides advice on health and information about illnesses.	National	Nurses	

OECD Country	Out-of-Hours Primary Care†	Acute, non-urgent telephone service	National / Regional	Triage staff	Other information
Switzerland[8, 60, 82]	GPC Hospital ED	Telephone Triage Service (0848 133 133). In the canton of Vaud (western Switzerland). In the canton of Neuchatel (western Switzerland).	Regional	Nurses	
Turkey[8]	Practice based Hospital ED	No acute, non-urgent telephone service available			
United Kingdom – England[8, 45, 83]	Practice based PCC Deputising	NHS 111 (111). Established in 2010. NHS 111 online service offers assessment for people aged 5 and over only.	National	Non-clinical trained call operator Paramedics	Over 50% of callers speak to either a nurse, doctor or pharmacist.
United Kingdom – Scotland[54, 84]	PCC	NHS 24 (111). Established in 2000. Scotland's online health information service offers quality assured health and care information including symptom checkers, Scotland's Service Directory, and mental health advice and resources	National	Non-clinical trained call operator	
United Kingdom – Wales[39, 85]	Practice based	NHS 111 (111). Established in 2016. NHS 111 Wales website – includes symptom checkers and information about local services.	National	Non-clinical trained call operator	If call handlers are unable to deal with the issue of the caller, call handler will transfer the call to a clinical advisor. If clinical advisor is unavailable, call handler will agree a time with caller for a clinical adviser to call you back. This will be within a four-hour timeframe.
United Kingdom – Northern Ireland[58, 86]	Practice based	HSC PhoneFirst (111). Established in 2020. NIdirect website in Northern Ireland – includes symptom checkers and information about local services.	National	Health professional	

OECD Country	Out-of-Hours Primary Care†	Acute, non-urgent telephone service	National / Regional	Triage staff	Other information
United States[8, 87]	Rota Hospital ED	There are no national dedicated acute, non-urgent service. Only multiple single-service providers available.	Regional		

Footnotes:

* Unclear if operators have clinical or non-clinical training.

† Practice based: GPs working OOH looking after own patients; Rota: Rota of GPs looking after own and each other's patients, often within a practice or call rotation; GPC: Usually regional, larger version of rota system; Deputising: GP services outsourced to a commercial entity; PCC: after hours walk-in primary care centre, minor injuries unit, urgent care centre, may be nurse- or GP-led; Hospital ED – may be emergency services only or * to denote where it has been reported as an OOH PC service integrated into a hospital.

Key: ED – emergency department; EMS – emergency medical service; GP – general practitioner; GPC – general practitioner cooperative; HSC – Health and Social Care; NA – not applicable; NHS – National Health Service; OECD – Organization for Economic Co-operation and Development; OOH – out-of-hours; PCC – primary care centre; SMS – short message/messaging service

Table A2. Search strategy

1 Sources searched

Databases	Results	Date searched
Medline Complete via Ovid	3044	15/01/2024
Embase via Ovid	1503	15/01/2024
Total	4547	
Total after duplicates removed in Endnote and Covidence	4038	

Grey Literature	Url	Results	Date searched
INAHTA	https://database.inahta.org/	38	13/02/2024
Lenus	https://www.lenus.ie/	0	13/02/2024
Google	https://www.google.com/	21	13/02/2024
TRIP Database	https://www.tripdatabase.com/	12	13/02/2024

2 Search strategies

Database Name	Medline Complete via Ovid 1946 to January 12, 2024
Date search was run	15/01/2024

#	Searches	Results
1	Emergency Medical Services/	49334
2	exp After-Hours Care/	2145
3	(urgent adj3 care).ab,ti.	4611
4	(non-urgent adj3 care).ab,ti.	170
5	(pre-hospital or "pre hospital" or prehospital).ab,ti.	21044
6	"out of hours care".ab,ti.	273
7	"after hours care".ab,ti.	141
8	"out of hours medical".ab,ti.	35
9	"after hours medical".ab,ti.	40
10	"out of hours service* ".ab,ti.	423
11	"after hours service* ".ab,ti.	72
12	"out of hours clinic* ".ab,ti.	30
13	"after hours clinic* ".ab,ti.	56
14	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13	67122
15	"Delivery of Health Care"/	120525

16	exp Triage/	15220
17	(Telephone adj3 (triag* or pathway*)).ab,ti.	756
18	((call-centre or electronic or web-based or virtual or video or online or digital) adj3 triag*).ab,ti.	281
19	e-triage.ab,ti.	14
20	((prehospital or pre-hospital) adj1 pathway*).ab,ti.	16
21	(Service adj1 (deliver* or reform* or reorganis* or reorganiz* or restructure* or chang* or innovat*)).ab,ti.	21008
22	15 or 16 or 17 or 18 or 19 or 20 or 21	153831
23	14 and 22	4776
24	limit 23 to yr="2004 -Current"	3468
25	afghanistan/ or exp africa/ or albania/ or andorra/ or antarctic regions/ or argentina/ or exp asia, central/ or exp asia, northern/ or exp asia, southeastern/ or exp atlantic islands/ or bahrain/ or bangladesh/ or bhutan/ or bolivia/ or borneo/ or "bosnia and herzegovina"/ or brazil/ or bulgaria/ or exp central america/ or exp china/ or colombia/ or "commonwealth of independent states"/ or croatia/ or "democratic people's republic of korea"/ or ecuador/ or gibraltar/ or guyana/ or exp india/ or indonesia/ or iran/ or iraq/ or jordan/ or kosovo/ or kuwait/ or lebanon/ or liechtenstein/ or macau/ or "macedonia (republic)"/ or exp melanesia/ or moldova/ or monaco/ or mongolia/ or montenegro/ or nepal/ or netherlands antilles/ or new guinea/ or oman/ or pakistan/ or paraguay/ or peru/ or philippines/ or qatar/ or "republic of belarus"/ or romania/ or exp russia/ or saudi arabia/ or serbia/ or sri lanka/ or suriname/ or syria/ or taiwan/ or exp transcaucasia/ or ukraine/ or uruguay/ or united arab emirates/ or exp ussr/ or venezuela/ or yemen/	1372432
26	"organisation for economic co-operation and development"/	579
27	australasia/ or exp australia/ or austria/ or exp baltic states/ or belgium/ or exp canada/ or chile/ or czech republic/ or europe/ or exp france/ or exp germany/ or greece/ or hungary/ or ireland/ or israel/ or exp italy/ or exp japan/ or korea/ or luxembourg/ or mexico/ or netherlands/ or new zealand/ or north america/ or poland/ or portugal/ or exp "republic of korea"/ or exp "scandinavian and nordic countries"/ or slovakia/ or slovenia/ or spain/ or switzerland/ or turkey/ or exp united kingdom/ or exp united states/	3509900
28	european union/	17876
29	developed countries/	21469

30	26 or 27 or 28 or 29	3526115
31	25 not 30	1279613
32	24 not 31	3194
33	limit 32 to (comment or letter)	150
34	32 not 33	3044

Database Name	Embase via Ovid 1974 to 2024 January 12
Date search was run	15/01/2024

#	Searches	Results
1	*emergency health service/	52537
2	out-of-hours care/	670
3	(urgent adj3 care).ab,ti.	7370
4	(non-urgent adj3 care).ab,ti.	252
5	(pre-hospital or "pre hospital" or prehospital).ab,ti.	30478
6	"out of hours care".ab,ti.	330
7	"after hours care".ab,ti.	151
8	"out of hours medical".ab,ti.	38
9	"after hours medical".ab,ti.	35
10	"out of hours service* ".ab,ti.	585
11	"after hours service* ".ab,ti.	89
12	"out of hours clinic* ".ab,ti.	49
13	"after hours clinic* ".ab,ti.	67
14	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13	86095
15	*health care delivery/	65716
16	patient triage/	5272
17	(Telephone adj3 (triag* or pathway*)).ab,ti.	1130
18	((call-centre or electronic or web-based or virtual or video or online or digital) adj3 triag*).ab,ti.	473
19	e-triag*.ab,ti.	40
20	(Service adj1 (deliver* or reform* or reorganis* or reorganiz* or restructure* or chang* or innovat*)).ab,ti.	26971
21	15 or 16 or 17 or 18 or 19 or 20	96341
22	afghanistan/ or exp africa/ or albania/ or andorra/ or antarctic regions/ or argentina/ or exp asia, central/ or exp asia, northern/ or exp asia, southeastern/ or exp atlantic islands/ or bahrain/ or	1819023

	bangladesh/ or bhutan/ or bolivia/ or borneo/ or "bosnia and herzegovina"/ or brazil/ or bulgaria/ or exp central america/ or exp china/ or colombia/ or "commonwealth of independent states"/ or croatia/ or "democratic people's republic of korea"/ or ecuador/ or gibraltar/ or guyana/ or exp india/ or indonesia/ or iran/ or iraq/ or jordan/ or kosovo/ or kuwait/ or lebanon/ or liechtenstein/ or macau/ or "macedonia (republic)"/ or exp melanesia/ or moldova/ or monaco/ or mongolia/ or montenegro/ or nepal/ or netherlands antilles/ or new guinea/ or oman/ or pakistan/ or paraguay/ or peru/ or philippines/ or qatar/ or "republic of belarus"/ or romania/ or exp russia/ or saudi arabia/ or serbia/ or sri lanka/ or suriname/ or syria/ or taiwan/ or exp transcaucasia/ or ukraine/ or uruguay/ or united arab emirates/ or exp ussr/ or venezuela/ or yemen/	
23	"organisation for economic co-operation and development"/	2823
24	australasia/ or exp australia/ or austria/ or exp baltic states/ or belgium/ or exp canada/ or chile/ or czech republic/ or europe/ or exp france/ or exp germany/ or greece/ or hungary/ or ireland/ or israel/ or exp italy/ or exp japan/ or korea/ or luxembourg/ or mexico/ or netherlands/ or new zealand/ or north america/ or poland/ or portugal/ or exp "republic of korea"/ or exp "scandinavian and nordic countries"/ or slovakia/ or slovenia/ or spain/ or switzerland/ or turkey/ or exp united kingdom/ or exp united states/	3762630
25	european union/	31872
26	developed countries/	34668
27	23 or 24 or 25 or 26	3796240
28	22 not 27	1638083
29	14 and 21	2549
30	29 not 28	2354
31	limit 30 to yr="2004 -Current"	1950
32	limit 31 to (conference abstract or conference paper or letter)	447
33	31 not 32	1503

Database Name	INAHTA database
Date search was run	13/02/2024
Search Strategies	Search 1: (prehospital)[abs] AND (triage)[abs] Search 2: "Triage"[mh] Search 3: "Emergency Medical Services"[mh] triag* Search 4: "After-Hours Care"[mh]

Database Name	Lenus
Date search was run	13/02/2024
Search Strategies	Search 1: Abstract: triage Abstract: urgent care Search 2: Abstract: triage Abstract: emergency Search 2: Mesh: Delivery of Health Care Mesh: emergency medical services

Database Name	Google
Date search was run	13/02/2024
Search Strategies	Multiple searches performed. Scanned first 100 results per search. Search 1: (prehosptial OR "out of hours" OR urgent) triage site:.se filetype:pdf Search 2: (prehosptial OR "out of hours" OR urgent) triage site:.dk filetype:pdf Search 3: (prehosptial OR "out of hours" OR urgent) triage site:.gov.uk filetype:pdf Search 4: (prehosptial OR "out of hours" OR urgent) triage site:gov.au filetype:pdf Search 5: (prehosptial OR "out of hours" OR urgent) triage site:.ca filetype:pdf Search 6: (prehosptial OR "out of hours" OR urgent) triage site:.jp filetype:pdf Search 7: "telephone triage" pathway site:.uk .pdf Search 8: "telephone triage" pathway site:.se .pdf Search 9: "telephone triage" pathway site:.au .pdf Search 10: "telephone triage" pathway site:.dk .pdf Search 11: "telephone triage" pathway site:.jp .pdf

Database Name	TRIP Database
Date search was run	13/02/2024
Search Strategies	Search 1: triag* "emergency services" Limit results to "all secondary evidence" Search 2: Population: prehospital OR "after hours" OR "out of hours" Intervention: Triag* Limit results to "all secondary evidence"

Table A3. Characteristics of included studies, grouped by country

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
Belgium					
How accurate is telephone triage in out-of-hours care? An observational trial in real patients[92]	Morreel, 2022	1733	Observational real-time simulation study	Tienen and Leuven, Belgium. All patients at GP or walk-in patients to ED between 21-28 October 2016 (Tienen) and 7-14 November 2016 (Leuven).	To assess the accuracy of TTAS.
The implementation of the nationwide out-of-hours phone number 1733 in Belgium: analysis of efficiency and safety[93]	Schoenmakers, 2021	1733	Cross-sectional data review	National. Sample of calls between May 4 and June 26, 2018.	To determine whether the adjusted protocol 'unwell for no clear reason' led to a safer and more efficient referral of calls to the appropriate care level.
Denmark					
Factors associated with under-triage and over-triage in telephone triage in Danish out-of-hours primary care: a natural quasi-experimental cross-sectional study of randomly selected and high-risk calls[103]	Graversen, 2023	1813 Medical Helpline	Secondary data analysis of a natural quasi-experimental study	Central and Capital Region. All callers to 1813 outside office hours between 23 November and 8 December 2016.	To investigate the risk of under-triage and over-triage in high-risk telephone calls to TTAS.
Socioeconomic inequality in telephone triage on triage response, hospitalization and 30-day mortality[104]	Gamst-Jensen, 2021	1813 Medical Helpline	Secondary data analysis of a prospective cohort study	Capital Region. Callers to 1813 between 23 January and 9 February 2017.	To examine the relation between socio-economic status and triage response.
Associations between degree-of-worry, self-rated health and acute hospitalisation after contacting a medical help	Jensen, 2021	1813 Medical Helpline	Prospective cohort study	Capital Region. Callers to 1813 between 24 January and 9 February 2017.	To investigate the association between degree-of-worry and self-rated health and hospitalisation within 48 hours after calling

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
line: a Danish prospective cohort study[95]					TTAS.
Possible associations between callers' degree-of-worry and their socio-economic status when contacting out-of-hours services: a prospective cohort study[96]	Thilsted, 2021	1813 Medical Helpline	Prospective cohort study	Capital Region. Callers to 1813 between 24 January and 9 February 2017.	To examine if low socio-economic status, marital status and non-Western ethnicity are associated to high degree-of-worry of callers to TTAS.
Self-rated worry is associated with hospital admission in out-of-hours telephone triage – a prospective cohort study[94]	Gamst-Jensen, 2020	1813 Medical Helpline	Prospective cohort study	Capital Region of Denmark. Callers to 1813 between 24 January and 9 February 2017.	To investigate the association between degree-of-worry and the likelihood of hospital admission within 48 hours after calling TTAS.
Communication quality in telephone triage conducted by general practitioners, nurses or physicians: a quasi-experimental study using the AQTT to assess audio-recorded telephone calls to out-of-hours primary care in Denmark[98]	Graversen, 2020a	1813 Medical Helpline	Natural quasi-experimental cross-sectional study	Central Region and Capital Region. Callers to 1813 outside office hours between 23 November and 8 December 2016.	To compare the quality of the communication in TTAS conducted by GPs, nurses and physicians with different medical specialities.
Safety, efficiency and health-related quality of telephone triage conducted by general practitioners, nurses, or physicians in out-of-hours primary care: a quasi-experimental study using the Assessment of Quality in Telephone Triage (AQTT) to assess audio[99]	Graversen, 2020b	1813 Medical Helpline	Natural quasi-experimental cross-sectional study	Central Region and Capital Region. Callers to 1813 outside office hours between 23 November and 8 December 2016.	To explore the safety, efficiency, and health-related quality of TTAS performed by GPs, nurses or physicians with different medical specialities.

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
Sociodemographic and health-related determinants for making repeated calls to a medical help line: a prospective cohort study[97]	Blakoe, 2019	1813 Medical Helpline	Prospective study	Capital Region of Denmark. Callers to 1813 between 18 January and 9 February 2017.	To identify the socio-demographic and health-related characteristics of individuals making repeated calls to TTAS.
Regional medical on-calls and the 1813 emergency number – A survey with a focus on organisation, activity and finances[44]	Vinge, 2018	1813 Medical Helpline	Comparative and descriptive mapping report	National data. Callers to 1813.	Mapping of 1813 with regard to organisation activity and finances.
Under-triage in telephone consultation is related to non-normative symptom description and interpersonal communication: a mixed methods study[101]	Gamst-Jensen, 2017	1813 Medical Helpline	Explanatory simultaneous mixed methods design	Capital Region. Callers to 1813 between 15 October and 30 November 2014 who met a criterion of potential under triage.	To assess the quality of under-triaged calls, and to identify communication patterns contributing to under-triage.
Citizens experiences of the emergency hotline 1813: Telephone survey among 1106 citizens who have called 1813 [100]	Gut, 2015	1813 Medical Helpline	Descriptive cross-sectional survey	Capital Region. Callers to 1813 in weeks five, six and seven of 2015.	To explore caller experience of using TTAS.
Patient experience of the capitals region emergency help line[102]	Gut, 2014	1813 Medical Helpline	Mixed methods report	Capital Region Callers to 1813 in week 18 of 2014.	To explore caller experience of using TTAS.
Finland					
Telephone triage performed by nurses reduces non-urgent ambulance missions: A prospective observational pilot study in Finland[105]	Roivainen, 2020	116 117 non-emergency medical on-call service	Prospective observational study	Kainuu, Northern Finland. Callers to the emergency medical service between 1 March 2018 and 28 April 2018 who were transferred to a telephone triage nurse.	To determine whether a nurse could assess care needs by telephone and guide callers to social and health care services in non-urgent situations.

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
Sweden					
Pathways to the Emergency Department – a national, cross-sectional study in Sweden[106]	Henricson, 2022	Swedish Healthcare Direct	National cross-sectional study	Sweden. Callers aged 18 years or older attending Swedish EDs over 24 hours on 25 April 2018.	To provide an overview of information for callers visiting Swedish EDs during 24 hours.
Malpractice claimed calls within the Swedish Healthcare Direct: a descriptive-comparative case study[111]	Björkman, 2021	Swedish Healthcare Direct	Retrospective descriptive and comparative design	Sweden. Callers with malpractice claims within SHD between January 2011 and December 2018.	To describe all malpractice claims and healthcare providers' reported measures regarding calls to 1177.
Observational study of the implementation of telephone advice nursing in Sweden: did callers follow recommendations and did the rate of healthcare visits change?[116]	Sundberg, 2021	Swedish Healthcare Direct	Observational study	Jönköping Region, Sweden. Callers to 1177 between 1 January 2014 and 31 December 2015.	To evaluate whether 1177 callers follow the advice, and whether there was any change in the level and trend of healthcare visits after the introduction of TTAS.
Health and healthcare barometer 2018: the population's attitudes to, expectations and experiences of health and medical care[113]	Tullberg, 2019	Swedish Healthcare Direct	Population-based survey	Sweden. General population aged 18 years and older. 2018.	To assess the population's trust, experience of access to healthcare and attitudes on various issues.
Telefonhänvisning till akuten bakom en stor del av besöken[110]	Helmrot, 2016	Swedish Healthcare Direct	Retrospective cohort design	Örebro, Sweden. Persons who visited Örebro University Hospital's Emergency Department between 1 October 2014 and 7 November 2014.	To investigate to what extent and in what way patients who visited the Emergency Department at Örebro University Hospital had been in contact with the health care system before the visit.
Influence of self-care advice	Gustafsson, 2016	Swedish	Cross-sectional study	Northern Sweden.	To explore the influence of

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
on patient satisfaction and healthcare utilization[107]		Healthcare Direct	using survey	Callers to 1177 during the first week of March 2014.	TTAS on healthcare utilisation and callers' satisfaction.
Feeling rejected or invited: experiences of persons seeking care advice at the Swedish Healthcare Direct organization.[114]	Winneby, 2014	Swedish Healthcare Direct	Inductive and qualitative design	Sweden. Callers to SHD during on-call hours who were directed to a care centre aged 18 years and older.	To assess the caller's experience of the care received after being triaged and directed to a care centre.
The care barometer – the population's attitudes to, knowledge or and expectations of healthcare[112]	Tullberg, 2014	Swedish Healthcare Direct	Population-based survey	Sweden. General population aged 18 years and older. 2013.	To assess the population's trust, experience of access to healthcare and attitudes on various issues.
Triage and patient satisfaction among callers in Swedish computer-supported telephone advice nursing[108]	Rahmqvist, 2011	Swedish Healthcare Direct	Cross-sectional survey study	Sweden. Callers to a single site of SHD (unknown), during one week in October 2008.	To analyse caller satisfaction with the TTAS.
Paediatric health calls to Swedish telenurses: A descriptive study of content and outcome[117]	Kaminsky, 2010	Swedish Healthcare Direct	Descriptive and comparative design	Sweden. Calls to eleven telenurses at a single SHD site in Sweden (unknown) over 11 months in 2004/5.	To describe paediatric calls between Swedish parents and telenurses.
Incident reporting in nurse-led national telephone triage in Sweden: The reported errors reveal a pattern that needs to be broken[109]	Ernesater, 2010	Swedish Healthcare Direct	Retrospective study	Sweden. Incident reports to six SHD sites during 2007.	To describe errors that lead to an incident report.
Callers' perceptions of receiving advice via a medical care help line.[115]	Strom, 2009	Swedish Healthcare Direct	Qualitative method with phenomenographic approach	South west Sweden. Callers to SHD on a single day in April 2005.	To describe callers' perceptions of receiving advice via a telephone help line for medical care.

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
Effects of health care counseling by telephone: an analysis of the counseling activities in 1177 in Östergötland and Jämtland (118)	Rahmqvist, 2009	Swedish Healthcare Direct	Mixed methods report: retrospective data linkage; cross-sectional survey	Sweden: Two regions. Calllers to SHD in Östergötland and in Jämtland during one week in October 2008.	To calculate the effects of TTAS on healthcare resources and caller experience of TTAS.
Switzerland					
Impact of a telephone triage service for noncritical emergencies in Switzerland: A cross-sectional study(119)	Thierrin, 2021	Telephone Triage Service	Cross-sectional study	Vaud, Switzerland. Callers to the telephone triage service aged 18 years and over during a 4 month period (24 July to 27 September 2018, and 23 October to 17 December 2018).	To calculate the effects of TTAS on healthcare resources and caller experience of TTAS.
England					
NHS 111 Quality Watch(134)	Nuffield Trust, 2023	NHS 111	Quantitative study	England. Callers to NHS 111 from April 2014 to December 2022.	To determine the number of calls to NHS 111 and the percentage that receive clinical input.
To what extent do callers follow the advice given by a non-emergency medical help line (NHS 111): A retrospective cohort study(120)	Nakubulwa, 2022	NHS 111	Retrospective observational cohort study using data linkage	London. Callers to NHS 111 between October 2013 and September 2017.	To assess compliance with the advice given in the NHS 111 call.
Impact of NHS 111 Online on the NHS 111 telephone service and urgent care system: a mixed-methods study(122)	Turner, 2021	NHS 111	Mixed methods report	England: 3 pilot sites. Callers to NHS 111 between October 2010 and December 2019. Callers to NHS 111 between October 2019 and February 2020.	To explore the impact of NHS 111 Online on the related TTAS and the experiences of people who use those services.

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
Patient compliance with NHS 111 advice: Analysis of adult call and ED attendance data 2013-2017[126]	Lewis, 2021	NHS 111	Data linkage study	England: 2 pilot sites. Callers to NHS 111 between April 2013 and March 2017.	To measure attendance at ED up to two days after an NHS 111 call.
Interactional misalignment in the UK NHS 111 healthcare telephone triage service[133]	Morgan, 2020	NHS 111	Cross-sectional qualitative study using conversation analysis	England. All serious incident associated with a call to NHS 111 between 1 March 2014 and 29 February 2016. Purposive sample of all other calls to NHS 111 from 1 Dec 2015 to 31 January 2016.	To identify common points within the NHS 111 call protocol where the resultant interactions appear vulnerable to misalignment.
Identifying the predictors of avoidable Emergency Department attendance after contact with the NHS 111 phone service: analysis of 16.6 million calls to 111 in England in 2015–2017[125]	Egan, 2020	NHS 111	Data linkage study	England. Callers to NHS 111 between March 2015 and October 2017 with record of if caller attended ED within 24 hours.	To measure the frequency of callers making avoidable ED attendances after contact with NHS 111 and to examine whether these attendances can be predicted reliably.
Impact of Emergency Medicine Consultants and Clinical Advisors on a NHS 111 Clinical Assessment Service[123]	Sen, 2019	NHS 111	Prospective observational study	England: one region Callers to NHS 111 where designation was either to attend ED within one hours or four hours.	To compare outcome of clinical advice given by emergency physicians versus non-physician clinical advisors.
Emergency Department (ED) attendance following Pathways NHS 111 calls [127]	NHS Digital, 2020	NHS 111	Statistical report using data linkage	England. Callers to NHS 111 with linked Hospital Episode Statistics data between 1 January 2018 and 28 December 2018.	To analyse NHS 111 telephone calls ending in an ED disposition, and subsequent ED attendances and hospital admissions.

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
NHS 111 prevents more than 12 million unnecessary A&E visits[128]	NHS England, 2019	NHS 111	Statistical report using data linkage	England. Callers to NHS 111 between April 2011 and September 2018.	To determine how many unnecessary visits to A&E NHS 111 has prevented.
Has the NHS 111 urgent care telephone service been a success? Case study and secondary data analysis in England[135]	Pope, 2017	NHS 111	Comparative mixed methods case study and secondary data analysis	England: Five NHS call centres. Callers to NHS 111 in the five centres between 2011 and 2013, and between February 2014 and July 2016 (Using NHS Minimum Data Set). Focus groups with staff and key stakeholders.	To describe NHS 111 service activity in the period 2014–2016.
Nuffield Winter Insight Briefing 2: NHS 111[132]	Dayan, 2017	NHS 111	Summary analysis of NHS reports	England. Callers to NHS 111 from 2013 to 2016.	To determine the number of NHS 111 callers dispatched to emergency services from 2013 to 2016 and whether they increase during winter months.
Effect of a national urgent care telephone triage service on population perceptions of urgent care provision: controlled before and after study[129]	Knowles, 2016	NHS 111	Controlled before and after population survey study	England: Four pilot sites. Callers to NHS 111 in the first year (2010 to 2011).	To measure the effect of NHS 111 on perceptions of urgent care provision and the health service generally.
Potential for advice from doctors to reduce the number of patients referred to Emergency Departments by NHS 111 call handlers: observational study[124]	Anderson, 2015	NHS 111	Observational study	England: Two sites. Callers to NHS 111 where a disposition of attend ED was given between September to December 2014.	To determine the effect of using experienced GPs to review the advice given by call handlers in NHS 111.
The use of primary and	Burger, 2015	NHS 111	Mixed methods	England: North West	To assess service use

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
secondary care services by children and young people following contact with NHS 111: investigating the patient experience and flow of four common conditions[121]			report: data linkage study; focus group; survey study	London, England. Callers to NHS 111 for children under 16 years of age between April 2013 and February 2015.	following NHS 111 telephone calls and examine which factors were associated with ED attendance.
Acceptability of NHS 111 the telephone service for urgent health care: cross sectional postal survey of users' views[131]	O'Cathain, 2014	NHS 111	Cross-sectional postal survey	England: Four pilot sites. Callers to NHS 111 between July and October 2011.	To explore users' views of NHS 111 in four pilot sites prior to national rollout of the service.
Awareness and use of a new urgent care telephone service, NHS 111: cross-sectional population survey[188]	Knowles, 2014	NHS 111	Telephone survey	England: Four pilot sites. Callers to NHS 111 in 2011, approximately 9 to 10 months after launch in each site.	To describe population awareness and use of NHS 111.
Impact of the urgent care telephone service NHS 111 pilot sites: a controlled before and after study[130]	Turner, 2013	NHS 111	Controlled before and after study using time series data analysis	England: Four pilot sites and three control sites. Callers to emergency and urgent care systems in the two years prior to service launch and first full year after (approximately 2009 to 2011).	To measure the impact of NHS 111 on the emergency and urgent care system.
Evaluation of NHS 111 pilot sites – final report[45]	Turner, 2012	NHS 111	Mixed methods report: descriptive analysis; postal survey; controlled before and after study; exploratory expert panel;	England: Four pilot sites. Expert panels and stakeholder interviews.	To consider how NHS 111 has been used in terms of service activity, call handling performance and the outcomes of call assessment during the first full year of operation.

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
			qualitative interviews with stakeholder; cost-consequence analysis		
Scotland					
NHS 24 Annual Accounts 2022-23[136]	NHS 24, 2023	NHS 24	Audit and financial report	N/A	NR
NHS 24 Patient Feedback Annual Report 2022-2023[137]	Lawrence, 2023	NHS 24	Feedback report	NR	NR
Telephone triage of young adults with chest pain: population analysis of NHS 24 calls in Scottish unscheduled care[138]	Hodgins, 2022	NHS 24	Retrospective population study using data linkage	Scotland. Users of NHS 24 aged 15 to 34 years with chest pain, between 1 January 2015 and 31 December 2017.	To assess the effectiveness of TTAS in identifying callers needing urgent attention.
Investigating the public's use of Scotland's primary care telephone advice service (NHS 24): a population-based cross-sectional study[140]	McAteer, 2016	NHS 24	Population-based cross-sectional study.	Scotland. Users of NHS 24 registered with 13 Scottish GP practices aged 18 years and older between March and September 2013.	To examine the public's use of NHS 24, with follow-up telephone interviews to explore participants' understanding and views about the service.
Examining the role of Scotland's telephone advice service (NHS 24) for managing health in the community: analysis of routinely collected NHS 24 data[139]	Elliott, 2015	NHS 24	Retrospective data analysis	Scotland. Users of NHS 24 between January and December 2011.	To explore how the public is using NHS 24 to manage their symptoms and health problems.
Implementation of a national, nurse-led telephone health service in	Roberts, 2009	NHS 24	Qualitative interview study	Scotland. Key stakeholders of NHS 24 and partners from NHS	To describe stakeholder and partner views on the complexities of

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
Scotland: assessing the consequences for remote and rural localities[141]				Boards across Scotland.	implementing a TTAS in remote and rural communities.
Evaluation of the Introduction of NHS 24 in Scotland[54]	Heaney, 2005	NHS 24	Mixed methods report: routine data analysis; qualitative interview; observation; cost-analysis	Scotland. Callers to NHS 24 between May 2002 and April 2005; staff and stakeholders.	To examine the impact of NHS 24 on partners and callers using the service. To explain the impact of implementation and to conduct an economic evaluation of the service.
Australia					
Annual report financial year 2022-2023[147]	Healthdirect Australia, 2023	Healthdirect	Financial report	N/A	Strategic Plan 2021-2024.
Audit of the Healthdirect nurse triage service "Attend an Emergency Department immediately" outcome[148]	McKenzie, 2021	Healthdirect	Adapted case-control design	National. Healthdirect users-Sample of calls between April and July 2021.	To establish the extent to which ED triage outcomes on the Healthdirect help line are clinically reasonable and appropriate.
Calling for confirmation, reassurance, and direction: Investigating patient compliance after accessing a telephone triage advice service[145]	Siddiqui, 2020	Healthdirect	Data linkage study	Regional hospital. Linkage of Healthdirect records to ED presentations. 2016-2017.	To determine the influence TTAS has on ED attendance.
Emergency Department Attendance after Telephone Triage: A Population-Based Data Linkage Study[142]	Gibson, 2018	Healthdirect	Population-based observational cohort	New South Wales. Healthdirect users. 2009-2012.	To investigate compliance with TTAS advice to attend ED.
Compliance with telephone triage advice among adults aged 45 years and older: an Australian data linkage study[143]	Tran, 2017	Healthdirect	Observational follow-up using record linkage	New South Wales. Healthdirect users-Sample of calls from middle-aged and older callers between July 2008	To assess the extent to which callers comply with TTAS advice.

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
				and December 2012.	
Use of a telenursing triage service by Victorian parents attending the emergency department for their child's lower urgency condition[149]	Turbitt, 2015	Nurse-On-Call	Cross-sectional study	Four hospitals in metropolitan Melbourne. Parents or guardians of children younger than nine years of age who attended ED for low urgency conditions. Between May to November 2014.	To investigate whether parents used the Nurse-On-Call before ED arrival.
Appropriateness of Healthdirect referrals to the emergency department compared with self-referrals and GP referrals[144]	Ng, 2012	Healthdirect	Prospective observational study	Royal Perth Hospital. Patients visiting ED from August 2008 to April 2009, three cohorts: Healthdirect referred, self-referred, GP-referred.	To characterise the appropriateness and patterns of Healthdirect referrals to the ED.
Delivery of Nurse-On-Call[150]	Victorian AG Office, 2010	Nurse-On-Call	Audit report	NR	To assess the effectiveness of the Nurse-On-Call service.
Compliance with advice and appropriateness of emergency presentation following contact with the Healthdirect telephone triage service[146]	Sprivulis, 2004	Healthdirect	Data linkage study	Fremantle Hospital. Healthdirect contacts with ED presentations in 2000.	To examine the impact of TTAS on ED attendance.
Canada					
Telephone Triage Services in Canada[43]	Young, 2023	Healthlink Alberta	Environmental Scan	National. Survey of key stakeholders involved in administration of TTAS.	To capture information related to the administration of telephone triage programs across Canadian jurisdictions.
Follow-through after calling a nurse telephone advice	DeCoster, 2010	Healthlink Alberta	Data linkage study	Alberta. Users of Healthlink	To explore the utilisation of health care services

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
line: a population-based study [151]				Alberta from April 2003 to March 2004.	following a call to a TTAS.
Japan					
Telephone Triage for Emergency Patients Reduces Unnecessary Ambulance Use: A Propensity Score Analysis With Population-Based Data in Osaka City, Japan[52]	Katayama, 2022a	7119	Retrospective observational study	Osaka, Japan. Callers to emergency care services where ambulances were dispatched between January 2016 and December 2019.	To assess the effect of TTAS for emergency callers on unnecessary ambulance use.
Association of a telephone triage service for emergency patients with better outcome: a population-based study in Osaka City, Japan[152]	Katayama, 2022b	7119	Retrospective observational study	Osaka, Japan. Callers to emergency care services where ambulances were dispatched between January 2016 and December 2019.	To evaluate the effect of TTAS on the outcome of emergency callers.
A retrospective quality assessment of the 7119 call triage system in Tokyo – telephone triage for non-ambulance cases. Journal of Telemedicine and Telecare[153]	Sakurai, 2014	7119	Prospective observational study with case matching	Tokyo, Japan. Walk-in patients at primary care facilities in a clinic or hospital who had called 7119 between November 2008 and June 2011.	To investigate the 7119 process by reviewing the outcome of triage.
The impact of an emergency telephone consultation service on the use of ambulances in Tokyo[76]	Morimura, 2011	7119	Pre- and post-interventional study	Tokyo, Japan. Callers to emergency care services where ambulances were dispatched between January 2016 and December 2019.	To test the hypothesis that the activity for the first year of operation of an emergency telephone consultation service contributed to a reduction in ambulance use in non-urgent cases and a decrease in the cost associated with

Title	Lead Author, Year	Telephone service	Study design	Population and setting	Purpose of study
					despatching ambulances.
New Zealand					
New Zealand Healthline call data used to measure the effect of travel time on the use of the emergency department[154]	Griffin, 2017	Healthline	Primary data analysis	New Zealand. Callers to Healthline between July 2010 and June 2012.	To explore the relationship between distance by travel time from healthcare services and service utilisation.
Healthline: do primary care doctors agree with the advice?[155]	St George, 2005	Healthline	Retrospective audit	New Zealand. Callers to Healthline from 31 January 2005: first 10 cases triaged to each disposition.	To examine the degree of concordance between primary medical care specialists with Healthline advice using the Care Enhance Call Centre software package.

Key: ED – emergency department; GP – general practitioner; N/A – not applicable; NHS – National Health Service; SHD – Swedish Healthcare Direct; TTAS – telephone triage advice service.

Table A4. Key outcomes assessed in included studies

Lead Author, Year	Country	Caller characteristics	Caller experience	Service use & goals	Service impacts	Appropriateness & Safety	Compliance	Costs
Morreel, 2022[92]	Belgium					✓		
Schoenmakers, 2021[93]	Belgium					✓		
Graversen, 2023[103]	Denmark			✓		✓		
Gamst-Jensen, 2021[104]	Denmark	✓						
Jensen, 2021[95]	Denmark		✓					
Thilsted, 2021[96]	Denmark	✓	✓					
Gamst-Jensen, 2020[94]	Denmark	✓						
Graversen, 2020a[98]	Denmark	✓	✓	✓		✓		
Graversen, 2020b[99]	Denmark	✓	✓			✓		
Blakoe, 2019[97]	Denmark	✓						
Vinge, 2018[44]	Denmark		✓	✓	✓	✓		✓
Gamst-Jensen, 2017[101]	Denmark		✓					
Gut, 2015[100]	Denmark	✓	✓					
Gut, 2014[102]	Denmark		✓	✓				
Roivainen, 2020[105]	Finland	✓				✓		
Henricson, 2022[106]	Sweden	✓			✓			
Björkman, 2021[111]	Sweden					✓		
Sundberg, 2021[116]	Sweden				✓		✓	
Tullberg, 2019[113]	Sweden		✓					
Helmrot, 2016[110]	Sweden				✓			
Gustafsson, 2016[107]	Sweden	✓			✓			
Winneby, 2014[114]	Sweden	✓	✓					
Tullberg, 2014[112]	Sweden		✓	✓				
Rahmqvist, 2011[108]	Sweden		✓		✓			✓
Kaminsky, 2010[117]	Sweden	✓						
Ernesater, 2010[109]	Sweden		✓			✓		
Strom, 2009[115]	Sweden		✓	✓				

Lead Author, Year	Country	Caller characteristics	Caller experience	Service use & goals	Service impacts	Appropriateness & Safety	Compliance	Costs
Rahmqvist, 2009[118]	Sweden		✓					✓
Thierrin, 2021[119]	Switzerland	✓	✓		✓		✓	
Nuffield Trust, 2023[134]	England			✓				
Nakubulwa, 2022[120]	England	✓					✓	
Turner, 2021[122]	England	✓	✓				✓	✓
Lewis, 2021[126]	England				✓		✓	
Morgan, 2020[133]	England			✓				
Egan, 2020[125]	England				✓			
Sen, 2019[123]	England				✓		✓	
NHS Digital, 2020[127]	England						✓	
NHS England, 2019[128]	England				✓			
Pope, 2017[135]	England		✓	✓	✓			
Dayan, 2017[132]	England			✓	✓			
Knowles, 2016[129]	England			✓				
Anderson, 2015[124]	England					✓		✓
Burger, 2015[121]	England	✓	✓	✓			✓	
O'Cathain, 2014[131]	England	✓	✓	✓			✓	
Knowles, 2014[188]	England			✓				
Turner, 2013[130]	England			✓	✓			
Turner, 2012[45]	England	✓	✓	✓	✓	✓	✓	✓
NHS 24, 2023[136]	Scotland			✓				✓
Lawrence, 2023[137]	Scotland		✓	✓				
Hodgins, 2022[138]	Scotland	✓				✓	✓	
McAteer, 2016[140]	Scotland	✓	✓	✓			✓	
Elliott, 2015[139]	Scotland	✓		✓				
Roberts, 2009[141]	Scotland			✓				
Heaney, 2005[54]	Scotland	✓	✓	✓	✓			✓
Healthdirect, 2023[147]	Australia		✓					✓
McKenzie, 2021[148]	Australia	✓	✓			✓		

Lead Author, Year	Country	Caller characteristics	Caller experience	Service use & goals	Service impacts	Appropriateness & Safety	Compliance	Costs
Siddiqui, 2020[145]	Australia	✓					✓	
Gibson, 2018[142]	Australia	✓				✓	✓	
Tran, 2017[143]	Australia	✓					✓	
Turbitt, 2015[149]	Australia	✓	✓	✓				
Ng, 2012[144]	Australia	✓				✓		
Victoria AG Office, 2010[150]	Australia		✓	✓	✓	✓	✓	✓
Sprivulis, 2004[146]	Australia	✓					✓	
Young, 2023[43]	Canada							✓
DeCoster, 2010[151]	Canada	✓					✓	
Katayama, 2022a[52]	Japan	✓			✓			
Katayama, 2022b[152]	Japan	✓			✓	✓		
Sakurai, 2014[153]	Japan						✓	
Morimura, 2011[76]	Japan	✓	✓					✓
Griffin, 2017[154]	New Zealand						✓	
St George, 2005[155]	New Zealand					✓		

Table A5. Caller characteristics

Study, Year	Country	Sample size[1] n=	Caller age % (n)	Caller gender female % (n)	Caller relationship to the patient^ % (n)
Gamst-Jensen, 2021[104]	Denmark	6,869	Median: Short education: 40 (IQR: 22-65) High SES: 44 (IQR: 31-61)	58.7	NR
Thilsted, 2021[96]	Denmark	6,869	46.5±20.0	58.3 (4,007)	NR
Gamst-Jensen, 2020[94]	Denmark	11,338	Mean: 30.5±25.5	54.1 (6,137)	NR
Graversen, 2020a[98] Graversen, 2020b[99]	Denmark	1,294	<18: 36.5 (472) 18-64: 51.1 (662) ≥65: 12 (155)	57.3 (742)	NR
Blakoe, 2019[97]	Denmark	11,595	Mean: One-time caller: 30.37 Repeat callers: 34.57	54.11 (6,274)	NR
Gut, 2015[100]	Denmark	NR	NR	NR	Calling for: Self: 47 Other: 53
Roivainen, 2020[105]	Finland	700	Mean: 72	50 (350)	NR
Henricson, 2022[106]	Sweden	3,875	Median: 59 (IQR: 18-107)	50	NR
Gustafsson, 2016[107]	Sweden	225	Mean: 48.15	69.3	Mothers called five times as often on behalf of their children as fathers did (χ^2 = 6.283, P = 0.012).
Winneby, 2014[114]	Sweden	8	21-60: 100 (8)	37.5	NR

Study, Year	Country	Sample size[1] n=	Caller age % (n)	Caller gender female % (n)	Caller relationship to the patient^ % (n)
Kaminsky, 2010[117]	Sweden	110	Median: 3.5 (IQR: 5 days-14.5 years)	NR	Calls made by: Mother: 73 (80) Father: 27 (30)
Nakubulwa, 2022[120]	England	1,964,726	<16: 49.7 (976323) 16-59: 36 (706814) ≥60: 16.8 (329397)	58 (1,130,984)	NR
Turner, 2021[122]	England	1,350,280	<16: 24.2 (327383) 16-74: 62 (836783) ≥75: 13.8 (186,096)	56.5 (762,741)	NR
Burger, 2015[121]	England	1,000	<1: 51 (510) 1-5: 12.8 (128) 6-11: 20.3 (203) 12-15: 2 (23)	44 (435)	Mother: 77 (773) Father: 20 (203) Other: 2 (17)
O'Cathain, 2014[131]	England	1,754	16-64: 75 (1315) ≥65: 25 (439)	71 (1,237)	NR
Turner, 2012[45]	England	1,769	16-64: 74.3 (1315)) ≥65: 25 (439)	71 (1,237)	NR
Hodgins, 2022[138]	Scotland	102,822	15-19: 19.6 (20,133) 20-24: 30.3 (31,130) 25-29: 27.2 (27,959) 30-34: 23.0 (23,598)	63.1 (64,845)	NR
McAteer, 2016[140]	Scotland	1,190	18-64: 60.8 (724) ≥65: 38.2 (455)	52.5 (617)	Calling for: Self: 45.4 (272) Child: 19 (114) Spouse: 19.9 (119)
Heaney, 2005[54]	Scotland	1,914,176	<16: 28.4 16-64: 51.7 ≥65: 19.9	59	Callers contacted NHS 24 on their own behalf: 40 Calling on behalf of someone else: 60

Study, Year	Country	Sample size[1] n=	Caller age % (n)	Caller gender female % (n)	Caller relationship to the patient^ % (n)
Thierrin, 2021[119]	Switzerland	412	18-59: 68 (280) ≥60:32 (132)	68.5 (282)	NR
McKenzie,2021	Australia	50,487	<20 years: 48 (24205) ≥20 years: 52 (26272)	58.7 (29644)	NR
Siddiqui, 2020[145]	Australia	2,857	<20: 38 (1,096) 20-59: 44 (1271) ≥60: 17 (490)	59 (1,693)	NR
Gibson, 2018[142]	Australia	1,041,749	Mean: 24.6±24.1	NR	Self: 45.24 (471,249) Parent: 44.8 (466,850) Carer: 0.40 (4117)
Tran, 2017[143]	Australia	11,088	45-64: 51.8 (5737) ≥65: 48.2 (5351)	63.2 (7,010)	Self: 82.8 (9,180) Spouse: 9.8 (1,089) Other: 6.6 (731)
Turbitt, 2015[149]	Australia	1,150	<1: 23 (258) 1-4: 51 (583) 5-9: 26 (302)	NR	NR
Ng, 2012[144]	Australia	720	Mean: 41.6±18.8	60.3 (434)	NR
Sprivulis, 2004[146]	Australia	842	<15: 34 (290) ≥15: 66 (552)	57 (481)	NR
De Coster, 2010[151]	Canada	96,368	<4: 43.6 4-19: 18.1 20-49: 29.7 50+: 8.6	59.3	NR
Katayama, 2022a[52]	Japan	8,828	Mean: 43.4±27.9	54.1 (4,778)	NR
Katayama, 2022b[152]	Japan	8,008	Mean: 43.4±27.9	53.9 (4,317)	NR
Morimura, 2011[76]	Japan	26,138	Mean: 28±27	46.1	Self: 31.4 Family: 62.6 Other: 5.5

[1] Sample size includes individual calls to the telephone triage service.

^ Top three as reported by each study
Key: IQR – interquartile range; n – number; NHS – National Health Service; NR – not reported; SES – socio-economic status; χ^2 – Pearson's Chi-square

Table A6. Socio-demographic indicators

Study, Year	Country	Sample size[1] n=	Socio-demographic indicators % (n=)	
Gamst-Jensen, 2021[104]	Denmark	6,869	**Education** Low: 25.7 (1,763) Middle/high: 70 (4,810)	**Household income** Low: 32.2 (2,211) Middle/high: 57 (3,918)
Thilsted, 2021[96]	Denmark	6,869	**Education** Low: 25.7 (1,763) Middle: 41 (2,820) High: 29 (1,990)	**Household income** Low: 32.2 (2,211) Middle: 28.8 (1,978) High: 28.2 (1,940)
Blakoe, 2019[97]	Denmark	11,595	**Annual household income** Very low/low: 56.86 (6,593) Middle: 28.53 (3,308) High: 14.61 (1,694)	
Gustafsson, 2016[107]	Sweden	225	**Education** Compulsory school: 19 (42) Secondary: 38.5 (85) Tertiary: 42.5 (94)	**Occupation** Working: 56.1 (n=125) Student: 6.7 (n=15) Retired: 27.8 (n=62)
Hodgins, 2022[138]	Scotland	102,822	**SIMD quintile** 1 (highest deprivation): 35.1 (36,063) 2-4: 53.9 (55,436) 5 (lowest deprivation): 10.6 (10,871)	
McAteer, 2016[140]	Scotland	1,190	**Education** No qualifications: 21.5 (238) Secondary: 35.5 (393) Higher: 43.1 (477)	**Household income** <15,000: 29.3 (n=288) 15,000-49,999: 51.3 (505) ≥50,000: 19.4 (191)

Thierrin, 2021[119]	Switzerland	412	**Education** Compulsory school: 18.0 (74) Apprenticeship/vocational school: 41.8 (172) Secondary: 11.4 (47) University: 27.2 (112)
Gibson, 2018[142]	Australia	1,041,749	**Household income** Quintile 1 (lowest SES): 15.11 (157,417) Quintile 2-4: 65.16 (678,838) Quintile 5 (highest SES): 19.73 (205, 494)
Turbitt, 2015[149]	Australia	1,150	**Household income** <80,000: 23 (251) 80,001-100,000: 17 (184) ≥100,000: 32 (350)

[1] Sample size includes individual calls to the alternative telephone triage service.
Key: n – number; SES – socio-economic status; SIMD – Scottish Index of Multiple Deprivation.

Table A7. Condition for which the call was made

Study, Year	Country	Sample size[1] n=	Condition for which the call was made^ % (n=)
Gamst-Jensen, 2020[94]	Denmark	11,338	Somatic illness: 54 (61.19) Somatic injury: 18.1 (2048) Not registered: 23.6 (2678)
Roivainen, 2020[105]	Finland	700	General and unspecified: 32.1 (225) Musculoskeletal: 22.3 (156) Back, limb or body pain: 19.1 (134)
Kaminsky, 2010[117]	Sweden	110	Ear problem: 13 (16) Rash/wound: 12 (15) Fever: 12 (15)

Nakubulwa, 2022[120]	England	1,964,726	Unclear urgent condition: 8 (282,610) Vomiting, cough, bringing up blood: 5 (162,738) Other reason: 34 (1,224,420)
McAteer, 2016[140]	Scotland	1,190	New symptom: 69 (414) Ongoing symptom: 28.5 (171) General health advice: 2.5 (15)
Elliott, 2015[139]	Scotland	NR	Abdominal: 12.2 (128,032) Dental: 6.8 (70,918) Rash/skin: 6.0 (62,649)
Siddiqui, 2020[145]	Australia	2,857	Illness NOS: 18.9 (539) Injury: 17.5 (500) Other: 12.2 (348)
Gibson, 2018[142]	Australia	1,041,749	Seen provider earlier: 16.94 (176,450) Skin, wounds: 12.31 (128,285) Head, neck, face symptoms: 9.61 (100,147)
Tran, 2017[143]	Australia	11,088	General symptoms: 15.3 (1,701) Limbs and extremities: 9.7 (1,075) Cardiac: 9.0 (998)
Turbitt, 2015[149]	Australia	1,150	Injury: 34 (373) Illness NOS: 66 (743)
Ng, 2012[144]	Australia	720	Gastrointestinal: 16.4 (118) Injury (external): 10.7 (77) Cardiovascular: 10.3 (74)
De Coster, 2010[151]	Canada	96,368	Gastrointestinal: 19.1 OB/GYN/GU: 12.9 Trauma: 12.3

[1] Sample size includes individual calls to the alternative telephone triage service.
^ Top three as reported by each study.
Key: n – number; NOS: not otherwise specified; OB/GYN/GU – obstetrics/gynaecology/genitourinary care.

Table A8. Volume of calls

Study, Year	Country	Service use
Graversen, 2023[103]	Denmark	Year: 2016 — 1813 calls n=: 806,000
Graversen, 2020a[98]	Denmark	Year: 2014 — 1813 calls n=: 911,000
Vinge, 2018[44]	Denmark	Year / 1813 calls per 1,000 citizens: 2009: 474; 2010: 462; 2011: 471; 2012: 469; 2013: 451; 2014: 448; 2015: 438; 2016: 435
Nuffield Trust, 2023[134]	England	Month / NHS 111 calls n=: Jan 2016: 1m; Jan 2023: 1.8m
Knowles, 2016[129]	England	Sample n=652: Any contact with NHS 111: 9 (60); First contact NHS 111: 8 (49)
Burger, 2015[121]	England	24 hrs prior to call / n= / n (%) OOH GP / n (%) ED visit: Breathless: 1405: 13 (0.1): 13 (1); Constipation: 196: : ; D&V: 3036: 21 (0.7): 51 (2); Fever: 1483: 28 (2): 32 (2)

Turner, 2013[130]	England	**n (%)** Population covered: 1,802,200 Calls connected to 111: 408,851 Direct dial 111: 251,190 (61.4) Triaged calls per year per 1,000 people: 154
Turner, 2012[45]	England	**Year**: 2011 — **NHS 111 calls n=**: 409,000
NHS 24, 2023[136]	Scotland	**Year**: 2022/23 — **NHS 24 calls n=**: 2,119,887
Lawrence, 2023[137]	Scotland	**Year** / **NHS 24 calls n=** 2020/21: 1,790,228 2021/22: 2,229,637 2022/23: 2,119,887
Elliott, 2015[139]	Scotland	**Year**: 2011 — **NHS 24 calls n=**: 1,285,038
Heaney, 2005[54]	Scotland	**Year**: April 2005 — **NHS 24 calls per 1,000**: 250

Key: ED – emergency department; m – million; n – number; OOH GP – out-of-hours general practitioner; NHS – National Health Service.

Table A9. How the service is perceived and used by members of the public

Study, Year	Country	Service use
Tullberg, 2014[112]	Sweden	▪ People knew they can call 1177 for advice and help about healthcare: 18 to 29 yrs: 59%, 30 to 39 yrs: 72%, 40 to 49 yrs: 62%, 50 to 59 yrs: 56%, 60 to 69 yrs: 57%, 70 to 79 yrs: 58%, 80+ yrs: 52% ▪ People find it easy to get through to 1177: 76%
Strom, 2009[115]	Sweden	▪ Being able to turn to a reliable service that is accessible on a 24-hour basis is perceived by callers as a source of security.

Burger, 2015[121]	England	▪ Call volumes were higher OOH ▪ Calls were rarely preceded with a visit to ED or OOH services
O'Cathain, 2014[131]	England	▪ 86% (n=1,495, 95% confidence interval: 85% to 88%) reported being 'definitely clear' about when to call NHS 111.
Knowles, 2014[188]	England	▪ 59% (n=4,687, 95% CI: 57% to 60%) had heard of NHS 111. Slightly lower levels of awareness for people in ethnic minority groups and those not owning their own home.
Turner, 2012[45]	England	▪ Awareness of NHS 111 increased by 59% prior to its implementation
McAteer, 2016[140]	Scotland	Potential improvements to NHS 24: ▪ Quicker response time ▪ More medically trained operators ▪ Less repetition ▪ More awareness of the system and how to use it
Elliott, 2015[139]	Scotland	▪ 82.6% calls were made OOH*
Roberts, 2009[141]	Scotland	Challenges during implementation of NHS 24 in remote and rural Scotland: ▪ Rigidity of the NHS 24 model ▪ Understanding local variation of health service delivery ▪ Achieving a balance between maintaining national clinical standards and local service delivery
Heaney, 2005[54]	Scotland	▪ 90% calls were made OOH*

* The OOH period was defined as calls between 18:00–08:00 weekdays: all day Saturday and Sunday, and on national public holidays.
Key: CI – confidence interval; ED – emergency department; GP – general practitioner; NHS – National Health Service; Yrs – Years

Table A10. Reasons for use or non-use of acute, non-urgent telephone services

Reasons for use	Reasons for non-use
▪ In need of urgent care[45] ▪ Unable to access GP during office hours[45, 54, 102] ▪ Lack of alternative OOH care[140] ▪ Wanted to see a doctor/get in touch with healthcare system[102]	▪ Accessible GP and ED services[102, 140] ▪ Lack of knowledge or awareness of the service[102, 140, 149] ▪ Repetitive, lengthy and prescriptive triage questioning[140] ▪ Long waiting period to speak to operator[102]

Reasons for use	Reasons for non-use
▪ Convenience[54, 140] ▪ Accessibility[140] ▪ Availability OOH[140] ▪ Anonymity[140] ▪ Early medical attention[140] ▪ Avoid unnecessary resource waste[140] ▪ Did not want to bother GP[54] ▪ Wanted information[54, 102] ▪ Unsure whom to contact[45, 54]	▪ Concerns regarding access to medical records[140] ▪ Difficulty communicating about illness over the telephone[140] ▪ Perception that service would not be helpful/had not been helpful in the past[149] ▪ Perception that would be referred to ED anyways[149] ▪ Phone number is not memorable[102]

Key: ED – emergency department; GP – general practitioner; OOH – out-of-hours.

Table A11. Service goals and quality development

<table>
<tr><th>Study, Year</th><th>Country</th><th>Service goals & quality development</th></tr>
<tr><td>Vinge, 2018[44]</td><td>Denmark</td><td>
<table>
<tr><th>Call answered within</th><th>Goal (%)</th><th>Achieved (%)
2016</th><th>2017</th></tr>
<tr><td>3 min</td><td>90</td><td>45</td><td>51</td></tr>
<tr><td>10 min</td><td>100</td><td>75</td><td>85</td></tr>
</table>
Quality development:
▪ Employee introduction and competence development
▪ Caller satisfaction surveys
▪ Internal and external audits on caller processes
</td></tr>
<tr><td>Nuffield Trust, 2023[134]</td><td>England</td><td>
<table>
<tr><th>Call answered within</th><th>Goal (%)</th><th>Achieved (%)
Jan 2016</th><th>April 2021</th><th>Nov 2022</th><th>Jan 2023</th></tr>
<tr><td>60 seconds</td><td>95</td><td>93</td><td>73</td><td>44</td><td>59</td></tr>
</table>
<table>
<tr><th>Calls</th><th>Goal (%)</th><th>Achieved (n=)
April 2021</th><th>Oct 2021</th><th>Oct 2022</th><th>Dec 2022</th></tr>
<tr><td>Abandoned – over 30s wait</td><td>Max 5</td><td>130,235</td><td>552,455</td><td>242,918</td><td>1,089,045</td></tr>
</table>
</td></tr>
<tr><td>Morgan, 2020[133]</td><td>England</td><td>Failure in call management process</td></tr>
<tr><td>Pope, 2017[135]</td><td>England</td><td>
<table>
<tr><th>Calls</th><th>Goal (%)</th><th>Achieved (%)
2014/15</th><th>2015/16</th></tr>
<tr><td>Abandoned within 60s</td><td>95</td><td>92.3</td><td>88.3</td></tr>
<tr><td>Abandoned – over 30s wait</td><td>Max 5</td><td>1.8</td><td>2.9</td></tr>
</table>
</td></tr>
<tr><td>Dayan, 2017[132]</td><td>England</td><td>
<table>
<tr><th>Calls</th><th>Goal (%)</th><th>Achieved</th></tr>
<tr><td>Abandoned within 60s</td><td>95</td><td>not met since summer 2014</td></tr>
</table>
</td></tr>
<tr><td>Turner, 2013[130]</td><td>England</td><td>All pilot sites met NQRs for call abandonment rates of no more than 5%, and 95% of calls answered within 60 seconds</td></tr>
</table>

<table>
<tr><td>Turner, 2012[45]</td><td>England</td><td>
<table>
<tr><th>Calls</th><th>NHS 111 calls n (%)</th></tr>
<tr><td>Abandoned</td><td>6,454 (1.58)</td></tr>
<tr><td>Answered within 60 seconds</td><td>341,284 (84.8)</td></tr>
<tr><td>Offered call back</td><td>6,558 (1.6)</td></tr>
<tr><td>Call backs within 10 minutes</td><td>3,832 (58.4)</td></tr>
</table>
Failure in call management process: Not achieved in 8 out of 54 cases (14.8%) assessed
NHS 111 was the sole contact for approximately 48% (n=832) of respondents
</td></tr>
<tr><td>NHS 24, 2023[136]</td><td>Scotland</td><td>
<table>
<tr><th>Calls answered</th><th>Goal (%)</th><th>Achieved (%) 2022/23</th></tr>
<tr><td>Within 5 minutes</td><td>50</td><td>25</td></tr>
<tr><td>After 5 minutes</td><td>10</td><td>16</td></tr>
</table>
</td></tr>
<tr><td>Heaney, 2005[54]</td><td>Scotland</td><td>Between January 2003 and January 2005 the level of call back increased from 2% to 34%</td></tr>
<tr><td>Victorian AG Office, 2010[150]</td><td>Australia</td><td>
<table>
<tr><th>Call answered within</th><th>Goal (%)</th><th>Achieved (%) June 2009</th></tr>
<tr><td>20 seconds</td><td>80</td><td>21</td></tr>
</table>
Average time for callers to speak to a registered nurse in 2009/10 was 33 seconds
Minimum standards for maximum of 5% of calls abandoned after 20 seconds: repeatedly breached in 2007 to 2009.
Quality development:
Internal audits of call process and compliance with guidelines
Annual reports of operational and clinical governance framework
</td></tr>
</table>

Key: AG – Auditor General; GP – general practitioner; ED – emergency department; n – number; m – minutes; NHS – National Health Service; NQR – National Quality Recommendation; s – seconds.

Appropriateness, safety and compliance

Table A12. Assessment of acute, non-urgent telephone service outcomes – appropriateness and safety

Study, Year	Country	Appropriateness	Safety concern	Findings
Morreel, 2022[92]	Belgium	Overall	NR	As assessed by physicians: 71%
		Under-triage		As assessed by physicians: 17%
		Over-triage		As assessed by physicians: 12%
Schoenmakers, 2021[93]	Belgium	Overall	NR	▪ As assessed by GP[π]: 94.4% (n=236) ▪ Calls allocated 'unwell for no reason': researcher assessed[Ω] same level of care as the operator for 68% of calls (n=111)
		Under-triage		▪ As assessed by GP: 0.8% (n=2) ▪ Calls allocated 'unwell for no reason': researcher assessed[Ω] 10% of calls (n=17) ▪ Calls allocated to specific primary care: researcher assessed[Ω] 11% of calls (n=22)
		Over-triage		▪ As assessed by GP: 5% (n=12) ▪ Calls allocated 'unwell for no reason': researcher assessed[Ω] 22% of calls (n=36) ▪ Calls allocated to specific primary care: researcher assessed[Ω] 12% of calls (n=24)
Graversen, 2023[103]	Denmark	Under-triage^	NR	▪ Risk of clinically relevant under-triage: 7.9% ▪ Compared to GP-led triage, nurse-led triage was associated with significantly less under-triage (RR: 0.47, 95% CI: 0.23-0.97) ▪ High-risk calls made during the night time were at a significantly higher risk of being under-triaged (13.2%) compared with calls made during the daytime or evening time (RR: 2.1, 95% CI: 1.05-4.07) ▪ Patients aged 30-59 years were at a lower risk of being under-triaged (6.3%) compared with elderly patients ≥60 years (11.3%) (RR: 0.55, 95% CI: 0.29-1.07)
		Over-triage^		▪ Risk of clinically relevant over-triage: 5.9% ▪ Compared with GP-led triage, nurse-led triage was associated with significantly more over-triage (RR=3.93, 95% CI: 1.50-10.53)

Study, Year	Country	Appropriateness	Safety concern	Findings
Graversen, 2020a[98]	Denmark	Under-triage^	NR	Under-triaged calls had significantly lower quality for overall perceived communication (Median: 5, 10th and 90th percentile: 2 to 8) and efficiency (Median: 5, 10th and 90th percentile: 1 to 8) compared to optimally triaged calls (perceived communication: Median: 7, 10th and 90th percentile: 4 to 9; perceived efficiency: Median: 6, 10th and 90th percentile: 2 to 8)
		Over-triage^		Over-triaged calls had significantly lower quality for overall perceived communication (Median: 6,10th and 90th percentile: 3 to 9) and efficiency (Median: 6, 10th and 90th percentile: 4 to 9), compared to optimally triaged calls (perceived communication: Median: 7, 10th and 90th percentile: 4 to 9; perceived efficiency: Median: 6, 10th and 90th percentile: 2 to 8)
Graversen, 2020b[99]	Denmark	Under-triage^		Significantly lower risk of under-triage for nurses compared to GPs (RR=0.51, 95% CI: 0.28-0.93) ▪ Nurse-led: 3.7% (n=15) ▪ GP led: 7.3% (n=29) ▪ Physicians: 6.1% (n=26)
		Over-triage^		Compared with GP-led triage, nurse-led triage was associated with significantly more over-triage (RR:2.13, 95% CI: 1.22-3.73) and physician led triage (RR:1.93, 95% CI: 1.10-3.39) ▪ Nurse-led: 9.1% (37) ▪ GP led: 4.3% (n=17) ▪ Physician: 8.2% (35)
Vinge, 2018[44]	Denmark	NR	Unintended incidents	▪ 2016: n=236 (no damage: n=109; mild injury: n=31; moderate damage: n=48; serious or fatal events: n=48) ▪ 2014: n=902
Roivainen, 2020[105]	Finland	NR	Unintended incidents	▪ Out of 700 calls, triage nurse upgraded the mission priority provided by EMCC: n=6 ▪ Required intensive care: n=3 ▪ Died within 48 hours of the call: n=3 Post-evaluation did not find contribution of TTAS to these incidents
Björkman2021[111]	Sweden	NR	Malpractice	Calls connected with malpractice claims: ▪ 2003-10: 42% (n=14) ▪ 2011-18: 48.6% (n=17)

Study, Year	Country	Appropriateness	Safety concern	Findings
Ernesater, 2010[109]	Sweden	NR	Safety of the disposition	One incident was reported for every 761 telephone calls. 25% (n=114) of callers were given incorrect assessment — for example, given the wrong advice or referred to the wrong level of care or to a healthcare provider in the wrong area
Anderson, 2015[124]	England	Overall	NR	As assessed by GP: 73% (n=1,074) of cases who were advised to attend ED would have been given alternative management advice by the GPs
Turner, 2012[45]	England	Overall	NR	85% (n=45) of cases disposition was assessed to be appropriate In 14.8% of cases (n=8) the call management process had not been achieved[δ]
Hodgins, 2022[138]	Scotland	NR	Safety of the disposition	0.1% (n=99) of callers who were given self-care advice were admitted to hospital within 7 days. 0.3% (n=27) received an 'acute and serious' diagnosis in hospital
McKenzie, 2021[148]	Australia	Overall	NR	Advice by TTAS was considered appropriate for 75% of calls. In 87.8% (n=65) of calls where the caller disagreed with the advice it was assessed that they had been appropriately triaged by TTAS
		Under-triage		▪ 46.67% (n=35) of calls under-triaged by the algorithm in case pathway 1* ▪ Under-triage more likely in calls related to limb pain (17%) compared to abdominal pain (12%) ▪ Under-triage more likely among adults aged 50-70 (27%) and adults aged ≥70 (20%)
		Over-triage		In case pathway 1, 10% of calls over-triaged by the algorithm In case pathway 2, 32% of calls over-triaged by the algorithm[β] **Factors influencing over-triage** ▪ Patient factors: ○ Anxiety or nervousness ○ Prior intention ▪ Nurse factors: ○ Failed to assist find lower-acuity care ▪ Geographical location
Gibson, 2018[142]	Australia	Overall	NR	▪ Needed medical attention within 120 minutes: Healthdirect callers: 7.8%, 95% CI: 7.6-7.9%, general attendees: 16.9%, 95% CI: 16.9-17.0%

Study, Year	Country	Appropriateness	Safety concern	Findings
				▪ Needed medical attention within 10 minutes: Healthdirect caller: 4.0%, 95% CI: 3.8-4.3%; general attendees: 8.4%, 95% CI:8.3-8.4%, Healthdirect-compliant callers:7%, 95% CI: 6.9-7.2%
Ng, 2012[144]	Australia	Overall	NR	**Appropriateness of referrals:** ▪ Healthdirect-referred patients: 72.9% (n=525, 95% CI: 69.7-76.2%) ▪ Self-referred patients: 73.8% (n=531, 95% CI: 70.5-77.0%) ▪ GP-referred patients: 89.7% (n=646, 95% CI: 87.5-91.9%) **Appropriateness of advice:** ▪ Emergency disposition: 78% (n=198, 95% CI: 72.2-82.8%) ▪ Acute disposition: 71.3% (n=181, 95% CI: 65.2-76.7%) ▪ Non-acute disposition: 57.7% (N=15, 95% CI: 37.2-76.0%) ▪ Ambulance: 89.7% (n=87, 95% CI: 83.5-95.9%)
Victorian AG Office, 2010[150]	Australia	NR	Unintended incidents	105 reported incidents out of 1.47 million calls
			Safety of the disposition	Potentially unsafe advice given in 10% (n=82) of calls analysed: 4% (n=31) assessed to be unsafe ▪ 2009-10: 2% of calls were assessed to be unsafe ▪ 2008-09: 5% of calls were assessed to be unsafe
Katayama, 2022b[152]	Japan	NR	Unfavourable outcomes	Of patients with unfavourable outcomes (n=407,568), 28.8% (n=2,305) used TTAS. Use of TTAS was inversely associated with the occurrence of an unfavourable outcome∞ (adjusted OR: 0.853; 95% CI: 0.809-0.899)
St George, 2005[155]	New Zealand	Overall	NR	▪ In 11.1% of cases (n=10), the median doctor¥ triaged to two or more lower endpoint ▪ In 71.1% of cases (n=64) the median doctor triaged to within one endpoint
		Under-triage		In 17.8% of cases (n=16), the median doctor¥ triaged two or more levels of care higher. The lower endpoint was considered to be unsafe in one case (1.1%)

Footnotes:
*Case pathway 1 refers to the pathway where the advice by the triage algorithm was see a doctor in 2, 6 or 12 hours and the final disposition and final outcome was attend ED immediately.
β Case pathway 2 refers to the pathway where the caller disagreed with the advice of the nurse to see a doctor in the community, and the caller indicated their intention to attend the ED.
ɲ Assessed by GP refers to the assessment of allocation of patients to specific primary care protocols by the GP on duty. This assessment was done when the patient presented at the general practitioner cooperative before the consult started.

Ω Researcher assessed refers to two researchers assessing the allocation of the caller to the protocol 'unwell for no clear reason'.
δ The call management process includes four processes: clear identification of the reason for call, early recognition of a serious/emergency situation, obtaining adequate history and performing adequate assessment.
∞ Unfavourable outcome refers to patients who were admitted, transferred, or died after care in the emergency department.
¥ The study compared the endpoint reached by the call operator (nurses) to the endpoints reached by the primary care specialists. The doctors varied in their advice for endpoints and hence, a median doctor-advised endpoint, referred to as median doctor, was used.
^ Based on the rating using the 'Assessment of Quality in Telephone Triage' (AQTT) tool. The accuracy of triage is measured on a 7-point scale. Optimally triaged calls are rated as '4', under-triaged calls are rated as '1 to 3', and over-triaged calls are rated as '5 to 7'.[103]
Key: CI – confidence interval; EMCC – emergency medical communication centre; ED – emergency department; GP – general practitioner; n – number; NR – not reported; TTAS – telephone triage advice service.

Table A13. Assessment of acute, non-urgent telephone service outcomes – disposition of callers (triage outcome)

Lead Author, Year	Country	Sample size* n=	Self-care %	Primary Care %	ED %	Ambulance %	Other services %
Morreel, 2022[92]	Belgium	1,029		71.2**		28.8	
Schoenmakers, 2021[93]	Belgium	202		97†**		3	
Vinge, 2018[44]	Denmark	781,664	20	22†	39	3	Prescription: 2 Specialist referral: 1 Other: 8
Roivainen, 2020[105]	Finland	765	19			63.7	Other social and healthcare services: 17.3
Rahmqvist, 2011[108]	Sweden	273	44.3	55.6			
Kaminsky, 2010[117]	Sweden	110 (paediatric population)	48	45†◇	ED 4%		Specialist referral: 3
Rahmqvist, 2009[118]	Sweden	4,035	48.8	34.3†	8.2	1.4	Specialist referral: 0.7
Strom, 2009[115]	Sweden	12	58.3	33.3	8.3		

Lead Author, Year	Country	Sample size* n=	Self-care %	Primary Care %	ED %	Ambulance %	Other services %
Thierrin, 2021[119]	Switzerland	412	18.7	36.8[†]	44.6		Specialist referral: 2.7
Nuffield Trust, 2023[134]	England	NR	15	46	18	11	Pharmacist: 0.4
Nakubulwa, 2022[120]	England	1,188,195	21.7	55.1[◇]	11.6	10.4	1.2
Lewis, 2021[126]	England	3,631,069	15.3	60.9[◇]	6.6	11.5	5.2
Egan, 2020[125]	England	16,563,946	15.2	59.3	9.2	12.9	3.4
Urgent and Emergency Care Digital Programme, NHS Digital[127]	England	11,800,000		55.8[†]	9.6[**]	13.3	Other: 20.7
Sen, 2019[123]	England	7	6.7	46.3	8	15	
Pope, 2017[135]	England	1,141,770	14.7	60	9	12.5	3.7
Anderson, 2015[124]	England	NR			8	16	
Burger, 2015[121]	England	39,177 (Paediatric population)		96[**]	1		3
		992	33.1	7.8	43.8[+]	10.9	Pharmacist: 0.9 Other: 3.6
O'Cathain, 2014[131]	England	1,690	10	9	49[+]	20	11
Turner, 2012[45]	England	277,163	19.6[‡]	54.2	6.6	11.9	Dental/Pharmacist: 2.6 Other: 5.1
		872	10%[#]	43%[+]	18%	18%	11% other

Lead Author, Year	Country	Sample size* n=	Self-care %	Primary Care %	ED %	Ambulance %	Other services %
Hodgins, 2022[138]	Scotland	102,822	8.2	69.3†	5.9	11.4	0.1
Elliot, 2015[139]	Scotland	1,342,010	11.3	54.3†+	11.3	0.6	Dentist: 4.8 Pharmacist: 2.2 Other health professional: 0.7 Other: 2.7
Heaney, 2005[54]	Scotland	1,914,176	18.9‡	63.1**	5	2.8	Community health care: 0.6 Other healthcare provider: 2.4 Dentist: 1.4 Other: 2
McKenzie, 2021[148]	Australia	50,487	9	38.4**	22.3	14.6	
Siddiqui, 2020[145]	Australia	10,819			30.4	6.6	
Gibson, 2018[142]	Australia	1,041,749	29.5	14.9			
Tran, 2017[143]	Australia	11,088	14.9	57.6**	14.8		Low-urgency dentist or other health provider: 12.7
DeCoster, 2010[151]	Canada-Alberta	96,368	35.7	50.6**	13.6		
Morimura, 2011[76]	Japan	26,138		68.8	12.8	18.3	
Griffin, 2017[154]	New Zealand	282,500	87		13		

Footnotes:
*Sample size includes individual calls to the telephone triage service.
** Breakdown for different urgencies provided in original study.
~ Two analyses per paper – data linkage results and survey results.
† Includes referrals to PC and OOH primary care.
◇ Primary and community care.
+ including 18% clinical call backs by NHS 24 clinicians.
‡ Including health information, terminated calls or calls about test results.
± Including GP practice, GP out of hours, WIC, urgent care, dental, pharmacy.
Key: ED – emergency department; n – number; NR – not reported.

Table A14. Assessment of acute, non-urgent telephone service outcomes – compliance

Study, Year	Country	Advice received	Complied with advice % (n) (95% CI)	Did not comply with advice % (n) (95% CI)
Sundberg, 2021[116]	Sweden	Primary care	Followed the recommendation to visit healthcare within 24 hours: 73 (75,159)	NR
		Self-care	Followed the recommendation to wait and see: 84 (50,836)	
Nakubulwa, 2022[120]	England	Not-specified	49 (371,894)	51 (387,244) F: 51, M: 50
		Self-care	81 (126,791)	19 (29,445)
		Primary care	35 (152,752)	65 (281,211)
		Emergency care	43 (38,568)	57 (50,637)
		Other services	67 (53,783)	33 (25,941)
Lewis, 2021[126]	England	Emergency care	68.6 (165,460)	~30
		Primary care		8.5 (188,299)
		Self-care		18.2 (191,449)
		Other services		16.1 (30,431)
O'Cathain, 2014[131]	England	Not specified	86 (1,435) (CI: 84-88)	Complied with some advice: 11 (180) Did not follow any of the advice: 3 (55)
Turner, 2021[122]	England	Not specified	Full compliance: 88 (683) Partial compliance: 9 (63)	4 (28)
NHS Digital, 2020[127]	England	Emergency care	71.9	26.9
Sen, 2019[123]	England	Not specified	97*	NR
Burger, 2015[121]	England	Emergency care	91 (889)	NR
Turner, 2012[45]	England	Not specified	Full compliance: 86 (1,435) (CI: 84-88) Partial compliance:11 (180)	3 (55)
Hodgins, 2022[138]	Scotland	Self-care	NR	10.6
		Emergency care		19.9
		Other services		18.7

Study, Year	Country	Advice received	Complied with advice % (n) (95% CI)	Did not comply with advice % (n) (95% CI)
McAteer, 2016[140]	Scotland	Other services	38.6 (219) contacted another health professional 71.7 (157) had been advised by NHS 24 to do so.	24.2 (53) decision of the caller 4.1 (9) advice of the family
Thierrin, 2021[119]	Switzerland	Not specified	87.7 (100)	12.3 (14)
Siddiqui, 2020[145]	Australia	Emergency care	29-69	NR
Gibson, 2018[142]	Australia	Emergency care	66.5 (CI: 66.3-66.8)	NR
Tran, 2017[143]	Australia	Self-care	77.5 (1284) (CI: 75.5-79.5)	7 (125) (CI: 6.1-7.9)
		Primary care	64.6 (4,123) (CI: 63.4-65.8)	NR
		Emergency care	68.6 (1,124) (CI: 66.4-70.9)	NR
Victorian AG Office, 2010[150]	Australia	Not specified	68	NR
		Primary care	44% for callers advised to see a doctor within two weeks to 80% for callers advised to see a doctor immediately	NR
Sprivulis, 2004[146]	Australia	Primary care	Non-urgent care: 91 (2,204) (CI: 90- 92)	NR
		Emergency care	Immediate or prompt care: 61 (963) (CI: 57-63)	
De Coster, 2010[151]	Canada	Self-care	83.7 (28,815)	NR
		Primary care	43.2 (17,985)	
		Emergency care	52.2 (6,872)	
Sakurai, 2014[153]	Japan	Not specified	NR	20 (11)
Griffin, 2017[154]	New Zealand	Emergency care	33.21 (12,055)	7.5 (18,204)

Key: AG – Auditor General; CI – confidence interval; F – female; M – male; n – number; NHS – National Health Service; NR – not reported.
*compliance assessed only when the emergency physicians were clinical advisors.

Table A15. Reasons for non-compliance with advice

Study, Year	Country	Advice received	Reasons for not complying with advice % (n)	
O'Cathain, 2014[131]	England	Not specified	Did not agree with advice	21 (35)
			Unable to follow advice	20 (30)
			Advice did not work	19 (32)
			Change of health problem	7 (11)
			Did not understand	2 (4)
			Other reasons	30 (50)
Burger, 2015[121]	England	Emergency care	Did not agree with advice	39 (32)
			Unable to follow advice	19 (16)
			Used alt option	24 (20)
Turner, 2012[45]	England	Not specified	Did not agree with advice	21 (35)
			Unable to follow advice	20 (33)
			Advice did not work	19 (32)
			Change of health problem	7 (11)
			Did not understand	2 (4)
			Other reasons	30 (50)
Hodgins, 2022[138]	Scotland	Self-care	Attended another service within 24 hours	

Key: n – number.

Table A16. Factors influencing compliance with advice

Study, Year	Country	Advice received	Factors positively influencing compliance with the advice, %				
			Age	Gender	OOH	Intent	SES/Income
Nakubulwa, 2022[120]	England	Not-specified	<15: 52-55 >60: 46-49		OOH: 52 Office hours: 42		
Siddiqui, 2020[145]	Australia	Emergency care				ED via ambulance: 53-69 Self-transport: 29-53	
Gibson, 2018[142]	Australia	Emergency care	<15: 69.1-71.9 ≥45: 62.4-69.5		OOH: 67.4	Attend ED: 73.43 Self-care: 56.72	Middle-high: 66-69 Lowest: 64
Tran, 2017[143]	Australia	Self-care	45-54: 83.8 ≥75: 73.3		OOH: 76.7 Office hours: 79.5	Self-care: 79.9 Emergency: 72.8	Middle-high: 76-78.5 Lowest: 74.5
		Primary care	45-54: 58.2 ≥55: 66.2-67		OOH: 65 Office hours: 63.6	Self-care: 56.1 Emergency: 70	Middle-high: 64-66.7 Lowest: 60
		Emergency care	>55: 67.6-71.9 45-54: 64		OOH: 70.2 Office hours: 63.2	Self-care: 55.1 Emergency: 76.5	Middle-high: 69-72.8 Lowest: 61.7
De Coster, 2010[151]	Canada	Self-care	0-4: 85.6 ≥50: 78.9	M: 83.8 F: 83.6	OOH: 86.6 Office hours: 81.8		<40,000: 84.1 >40,000: 83.9-83.0
		Primary care	0-4: 34.2 ≥50: 51.1	M: 43.1 F: 43.2	OOH: 43.4 Office hours: 43.1		<40,000: 41.1 >40,000: 42.5-46.0
		Emergency care	0-4: 44.8 ≥50: 65.5	M: 53.3 F: 51.4	OOH: 52.6 Office hours: 52.1		<40,000: 48.2 >40,000: 52.2-55.1
Griffin, 2017[154]	New Zealand	Emergency care	Less drive time to the ED (0-<5 minutes: 39.4 vs over 40 minutes: 12.5)				

Key: ED – emergency department; F – Female, M – Male; OOH – out-of-hours; SES – socio-economic status.

Table A17. Reported costs

Study, Year	Country	Methods	Costs calculated	Cost elements	Cost in home currency	Cost in Irish Euro[1]	Further information
Vinge, 2018[44]	Denmark	Administration and management costs not included in cost of call	Annual cost of service^	Overall	DKK 118.4m	€13.3m	Third year of service (2016)
				▪ Transport	DKK 6m	€668,395	
				▪ Premises	DKK 2.3m	€256,480	
				▪ Technology	DKK 5.5m	€619,724	
				▪ Salaries	DKK 104.6m	€11.7m	
			Cost per call	Labour costs only.	DKK 109	€12.27	
Rahmqvist, 2009[118]	Sweden	NR	Annual cost of service	Direct costs of staff salaries, overheads and resources — for example, ambulance or ED visit.	SEK 17m	€1.8 million	Fifth year of service (2008)
			Cost per call		SEK 85	€9.14	
			Annual resource saving/spend		SEK 77m saving SEK 180 to 190 per capita saving	€8.3m €19.36 to €20.43	95% CI: SEK 54m to 101m Fifth year of service (2008)
Turner, 2021[122]	England	Cost-consequence analysis. NHS perspective. Time horizon of two further contacts (within 7 days).	Cost per call	Direct healthcare resources costs.	£11.40	€13.36	Eighteenth year of service (2019)
			Annual cost of service	NHS 111 telephone service only. Includes costs of associated service use.	£1470.7m	€1742.9m	
			Resource saving/spend of parallel NHS 111 online and NHS 111 telephone±	0% substitution	£1551m	€1838.1m	
				20% substitution	£1508.5m	€1787.7m	
				40% substitution	£1455.1m	€1724.4m	
				60% substitution	£1423.7m	€1687.2m	
				80% substitution	£1381.2m	€1636.8m	
				100% substitution	£1338.8m	€1586.6m	

Study, Year	Country	Methods	Costs calculated	Cost elements	Cost in home currency	Cost in Irish Euro[1]	Further information
Anderson, 2015[124]	England	Cost analysis of use of experienced GPs to review NHS 111 call handler advice.	Resource saving/spend	Cost of ED visit. Cost of employing GP per session.	£52,528 saving for EDs £41,416 spend on GPs	€62,250 €49,081	Cambridgeshire and Peterborough NHS 111 service. 4 GPs employed.
Turner, 2012[45]	England	Cost analysis. NHS and Personal Social Services perspective. Parametric sampling to determine the probability that NHS 111 was a cost saving policy.	Monthly cost of service	Cost of providing NHS 111 at pilot sites. Cost of changes to urgent and emergency care system once NHS 111 in operation.[≠]	£307,782	€360,833	95% CI: -£118,339 to £733,904. First year of service (2011) Four pilot sites.
			Cost per call		£12.26	€14.37	First year of service (2010/11) Four pilot sites.
NHS 24, 2023[136]	Scotland	Annual financial reports.	Annual cost of NHS 24[◇]	Overall	£105m	€119m	Twenty-third year of service (2023)
				▪ Staff costs	£79.3m	€89.9m	
				▪ Technology	£17.8m	€20.2m	
				▪ Property and administration	£10m	€11.4m	
				▪ Other	£265,000	€300,415	
			Clinical and medical compensation	Contingent cost of clinical and medical compensation payments including indemnity scheme costs.	£2.2m	€2.5m	
Heaney, 2005[54]	Scotland	Cost analysis: short-run average revenue costs, alongside appropriate capital and overhead allocations, as a proxy for long-run marginal opportunity costs.	Capital expenditure (cumulative)	Set-up costs and capital expenditure.	£25.2m[¥]	€36.1m	First five years of service (2000–2005)
			Total cost of NHS (cumulative)[*]	Revenue expenditure + cumulative AEC of capital investments.	£115.4m	€165m	First five years of service (2000–2005)
			Annual capital expenditure		£759,000	€1.1m	Fifth year of service (2005)

Study, Year	Country	Methods	Costs calculated	Cost elements	Cost in home currency	Cost in Irish Euro[1]	Further information
		Top-down, facility-based approach. Market costs as proxy opportunity costs for resources depleted. Public policy perspective: mainly from the viewpoint of the NHS in Scotland. Does not incorporate health outcomes. Discount rate of 3.5%.	Annual revenue costs	Revenue expenditure	£41.9m	€59.8m	Fifth year of service (2005)
			Annual cost of NHS 24*	Revenue expenditure + cumulative AEC of capital investments.	£45.6m	€65.2m	Fifth year of service (2005)
			Monthly cost of NHS 24		£3.8m	€5.4m	Fifth year of service (2005)
			Cost per call.	Capital and revenue costs.	£35.69	€51.01	Fifth year of service (2005)
			Resource saving/spend	Incremental costs associated with accessing primary care advice through traditional access routes if NHS 24 were not available.‡	-£1.3m	-€1.8m	Range £13.2m (low) to £24.4m (high)‡
				Incremental costs per call to NHS 24 compared to in-hours GP services.‡	£13.69	€19.57	Range £16.69 (low) to £9.69 (high)‡
				Incremental costs per call to NHS 24 compared to OOH GP services.‡	-£2.42	-€3.46	Range £16.52 (low) to -£21.82 (high)‡
				Incremental costs per call to NHS 24 compared to a combination of 10% in-hours and 90% OOH GP services.‡	£0.99	€1.42	Range £16.54 (low) to -£18.31 (high)‡
Healthdirect, 2023[147]	Australia	Financial statements of Healthdirect Australia limited.	Annual cost of service	Overall	AUD $216.8m	€116.7m	
				▪ Call centre	AUD $144m	€77.5m	
				▪ Salary	AUD $46.7m	€25.1m	
				▪ Website management	AUD$742,877	€399,886	

Study, Year	Country	Methods	Costs calculated	Cost elements	Cost in home currency	Cost in Irish Euro[1]	Further information
				▪ Design, develop and build	AUD $4.9m	€2.7m	Seventeenth year of service (2022/23)
				▪ Technology support	AUD $9.9m	€5.3m	
				▪ Marketing and advertising	AUD $1.4m	€773,526	
				▪ Transport	AUD $259,186	€139,518	
				▪ Premises	AUD $700,836	€377,255	
Victorian AG Office, 2010(150)	Australia	NR	Set-up costs	NR	AUD $8.5m	€5.3m	PA for three years (2006-2009)
			Annual cost of service	NR	AUD $9.9m	€6.2m	Fourth year of service (2009)
			Resource savings	NR	AUD $4.6m	€2.9m	Third year of service (2008)
Morimura, 2011(76)	Japan	NR	Set-up costs	Including personnel costs and depreciation.	¥321.4m	€2.6m	First year of service (2006/07)
			Resource savings	Ambulance use	¥999.7m	€8m	

[1]Converted to euros using OECD Purchasing Price Parity Index in relevant year.
^The cost of home visits by 1813 physicians are included in this figure as per 1813 remit, but the cost of ambulatory contacts in ED are not included.
± National policy costs based on 13,765,413 triaged calls for NHS 111 telephone plus 1,985,387 online contacts when there is no reduction in 111 telephone calls related to NHS 111 Online.
* Applying 3.5% discount rate to calculate annual equivalent cost of capital expenditures; based on NHS 24 asset life periods; & adjusted for inflation (HCHS Pay & Prices 2000–2004).
≠ Urgent and emergency care systems including: emergency ambulance calls and incidents; emergency departments; GP out-of-hours services; walk-in centres; urgent care centres; minor injury units; NHS Direct.
† Average cost of all services utilised per NHS 111 call.
◇ Includes cost of other services delivered by NHS 24.
‡ Scenario analyses based on low, mid and high costs as reported.(54) Low and high costs presented as range.
Key: AEC – annualised equivalent cost; AUD – Australian dollar; CI – confidence interval; DKK – Danish krone; ED – emergency department; GP – general practitioner; m – million; NR – not reported; OOH – Out-of-hours; PA – per annum; SEK – Swedish krona; ¥ – Japanese yen.

Table A18. Population distribution for selected countries

Country	Population	Population density persons per km² (range)*	Year	GPs per 1,000 (2020)[327]	ED visits per 100 people (2021)[203]
Belgium[328]	11.7m	381 (218-7,642)	2023	1.2	23.3
Denmark[329, 330]	6m	146.4 (0–12,021)	2024	0.8	29.5
Finland[330, 331]	5.6m	18.2	2023	1.4	21.1
Sweden[330, 332]	10.5m	25.9 (0.2–6,441)	2023	0.6	16.8
England[195]	57.1m	438 (50-16,478)	2021	0.8	43.1
Scotland[195, 197]	5.5m	70 (9-3,567)	2022		
Switzerland[333]	8.9m	220.3	2023	1.1	20.6
Australia[196, 330, 334]	26m	3.3 (0–38,401)	2022	1.8	34.2
Canada[330, 335]	37m	4.4	2021	1.3	36.6
Japan[186]	124.95m	338.2	2021	NR	NR
New Zealand[330, 336]	5.3m	19.4	2021	1.2	23.0
Ireland[299]	**5.1m**	**73 (0.7–26,185)**	**2022**	**1.9**	**25.8**

* differences exist among countries in the methods of defining smaller areas of population density from which the ranges are derived.

Key: ED – emergency department; GP – general practitioner; km² – square kilometre; m – million; NR – not reported.

Table A19. Itemised costs for low and high demand for an acute, non-urgent telephone service 24 hours a day, seven days a week

Parameter	Unit cost (including VAT)	Total cost low-demand 270,000 calls (€)		Total cost high-demand 960,000 calls (€)		Source
		Non-clinical call handlers	Clinical call handlers	Non-clinical call handlers	Clinical call handlers	
Office set up						
Desk	1,497	114,264	100,293	345,786	297,386	Public sector facilities expert[337]
Chair	204	15,586	13,680	47,166	40,564	
Lockers	646	49,077	43,265	149,168	105,903	
Canteen tables	406	2,030	2,030	4,059	4,059	
Canteen chairs	129	2,583	2,583	5,166	5,166	
Meeting room chairs	95	2,841	2,841	4,736	2,841	
Meeting room tables	720	1,439	1,439	2,878	1,439	
Soft seating 2-seater sofa	1,661	1,661	1,661	3,321	3,321	
Soft seating arm chair	1,107	1,107	1,107	2,214	2,214	
Coffee tables	264	264	264	529	529	
Board table	1,993	1,993	1,993	1,993	1,993	
Filing cabinets	363	2,177	2,177	7,357	5,478	
Storage cupboards	219	876	876	2,959	2,204	
Hardware						

Laptop	808	18,574	18,574	46,840	46,840	Online retailers (338-345)
Desktop	687	36,649	30,235	118,879	96,661	
Monitor	101	20,002	18,122	58,193	51,682	
Headset	54	8,283	6,768	27,990	22,739	
Mouse and keyboard	33	3,284	2,975	9,554	8,485	
Docking station	228	10,465	10,465	26,390	26,390	
Conference room monitors	1,133	15,860	15,860	30,586	30,586	
Printers	3,682	7,365	7,365	14,729	14,729	
Software						
Software development, licences and maintenance (cost per staff member)	9,527	1,457,661	1,190,900	4,925,561	4,001,423	NHS 24 Scotland[265]
Telecommunications (cost per staff member)	2,144	328,048	268,013	1,108,501	900,523	
Public information campaign (cost for organisation)						
Research and creative development – foundational research to inform campaign and test concepts					50,000	HSE Programme and Campaigns Office [318]
Research and creative development – creative development and production					500,000	
Media launch (TV, radio, print, social media, outdoor advertisement)					1,200,000	

Public information materials – design, print and delivery of leaflet promoting new service to all homes in Ireland					640,000	
Public information materials – accessible formats and translations					50,000	
Staff training and support						
Strategic human resources development (priced per staff member)	749	114,550	93,586	387,073	314,450	HIQA[316]
Premises rent						
Office of Public Works (OPW) national average per square metre	342	393,146	346,571	1,194,507	1,023,961	OPW[319]

Key: HSE – Health Service Executive; HIQA – Health Information and Quality Authority; NHS – National Health Service; OPW – Office of Public Works; VAT – value added tax.

Table A20. Itemised costs for low and high demand for an acute, non-urgent telephone service OOH

Parameter	Unit cost (including VAT)	Total cost 120,000 calls (€)		Total cost 200,000 calls (€)		Total cost 420,000 calls (€)		Total cost 710,000 calls (€)		Source
		Non-clinical call handlers	Clinical call handlers	Non-clinical call handlers	Clinical call handlers	Non-clinical call handlers	Clinical call handlers	Non-clinical call handlers	Clinical call handlers	
Office set up										
Desk	1,497	72,600	66,612	95,802	84,575	160,169	138,464	254,475	218,549	Public sector facilities expert[337]
Chair	204	9,903	9,086	13,068	11,536	21,847	18,887	34,711	29,810	
Lockers	646	31,642	29,059	41,328	36,808	69,095	60,055	109,778	94,280	
Canteen tables	406	1,218	1,218	1,218	1,218	2,030	2,030	3,247	3,247	
Canteen chairs	129	1,550	1,550	1,550	1,550	2,583	2,583	4,133	4,133	
Meeting room chairs	95	1,894	1,894	2,841	2,841	2,841	2,841	3,788	3,788	
Meeting room tables	720	720	720	1,439	1,439	1,439	1,439	2,159	2,159	
Soft seating 2-seater sofa	1,661	1,661	1,661	1,661	1,661	1,661	1,661	3,321	3,321	
Soft seating arm chair	1,107	1,107	1,107	1,107	1,107	1,107	1,107	2,214	2,214	
Coffee tables	264	264	264	264	264	264	264	529	529	
Board table	1,993	1,993	1,993	1,993	1,993	1,993	1,993	1,993	1,993	
Filing cabinets	363	2,177	2,177	2,177	2,177	4,354	4,354	5,478	5,443	

Storage cupboards	219	876	876	876	876	1,752	1,752	2,204	2,189	
Hardware										
Laptop	808	14,536	14,536	16,959	16,959	24,227	24,227	29,880	29,880	Online retailers [338-345]
Desktop	687	20,958	18,210	29,548	24,394	52,911	42,948	84,521	74,900	
Monitor	101	13,390	12,585	17,116	15,605	27,586	24,667	39,668	36,849	
Headset	54	3,194	2,761	4,710	3,898	8,879	7,309	14,239	11,640	
Mouse and keyboard	33	2,198	2,066	2,810	2,562	4,529	4,050	6,513	6,050	
Docking station	228	8,190	8,190	9,555	9,555	13,650	13,650	16,835	16,835	
Conference room monitors	1,133	15,860	15,860	15,860	15,860	15,860	15,860	30,586	30,586	
Printers	3,682	7,365	7,365	7,365	7,365	7,365	7,365	14,729	14,729	
Software										
Software development, licences and maintenance (cost per staff member)	9,527	562,105	485,887	828,866	685,958	1,562,460	1,286,172	2,505,653	2,048,348	NHS 24 Scotland[265]
Telecommunications (cost per staff member)	2,144	126,502	109,349	186,537	154,375	351,633	289,454	563,899	460,982	
Public information campaign (cost for organisation)										
Research and creative									50,000	HSE Programme

Development – foundational research to inform campaign and test concepts		and Campaigns Office [318]
Research and creative development – creative development and production	500,000	
Media launch (TV, radio, print, social media, outdoor advertisement)	1,200,000	
Public information materials – design, print and delivery of leaflet promoting new service to all homes in Ireland	640,000	
Public information materials – accessible formats and translations	50,000	

Staff training and support										
Strategic human resources development (priced per staff member)	749	44,173	38,183	65,136	53,906	122,785	101,073	196,905	160,968	HIQA[316]
Premises rent										
Office of Public Works (OPW) national average per square metre	342	253,422	232,874	330,818	294,860	553,418	480,816	879,100	755,128	OPW[319]

Key: HSE – Health Service Executive; HIQA – Health Information and Quality Authority; NHS – National Health Service; OOH – out-of-hours; OPW – Office of Public Works; VAT – value added tax.

Table A21. Itemised budget impact of the implementation of an acute, non-urgent telephone service 24 hours a day, seven days a week with 270,000 annual calls (low-demand scenario) staffed by clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	10,068,058	10,571,461	11,074,863	11,578,266	12,081,669	55,374,317
Hardware	110,364	5,518	5,518	54,328	5,518	181,246
Software and telecommunications	1,458,913	1,531,858	1,604,804	1,677,750	1,750,695	8,024,020
Office set up	174,209	0	0	17,421	0	191,629
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	93,586	98,266	102,945	107,624	112,304	514,724
Premises rent	346,571	346,571	346,571	346,571	346,571	1,732,857
Total	**14,691,701**	**13,153,674**	**€13,734,702**	**14,381,960**	**14,896,757**	**70,858,794**

Table A22. Itemised budget impact of the implementation of an acute, non-urgent telephone service 24 hours a day, seven days a week with 960,000 annual calls (high-demand scenario) staffed by clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	32,246,064	33,858,368	35,470,671	37,082,974	38,695,277	177,353,354
Hardware	298,113	14,906	14,906	158,406	14,906	501,235
Software and telecommunications	4,901,946	5,147,044	5,392,141	5,637,238	5,882,336	26,960,706
Office set up	473,097	0	0	47,310	0	520,406
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	314,450	330,172	345,895	361,617	377,340	1,729,474
Premises rent	1,023,961	1,023,961	1,023,961	1,023,961	1,023,961	5,119,805
Total	**41,697,631**	**40,974,450**	**42,847,573**	**44,911,506**	**46,593,819**	**217,024,981**

Table A23. Itemised budget impact of the implementation of an acute, non-urgent telephone service OOH with 120,000 annual calls (low-demand scenario) staffed by non-clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	4,953,080	5,200,734	5,448,388	5,696,042	5,943,696	27,241,941
Hardware	85,692	4,285	4,285	39,779	4,285	138,326
Software and telecommunications	688,607	723,037	757,467	791,898	826,328	3,787,337
Office set up	127,603	0	0	12,760	0	140,364
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	44,173	46,381	48,590	50,799	53,007	242,950
Premises rent	253,422	253,422	253,422	253,422	253,422	1,267,109
Total	**8,592,577**	**6,827,859**	**7,112,152**	**7,444,700**	**7,680,738**	**37,658,026**

Key: OOH – out-of-hours.

Table A24. Itemised budget impact of the implementation of an acute, non-urgent telephone service OOH with 120,000 annual calls (low-demand scenario) staffed by clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	4,492,368	4,716,987	4,941,605	5,166,224	5,390,842	24,708,027
Hardware	81,573	4,079	4,079	36,825	4,079	130,634
Software and telecommunications	595,236	624,998	654,760	684,522	714,284	3,273,800
Office set up	118,216	0	0	11,822	0	130,038
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	38,183	40,092	42,002	43,911	45,820	210,008
Premises rent	232,874	232,874	232,874	232,874	232,874	1,164,370
Total	**7,998,451**	**6,219,030**	**6,475,320**	**6,776,177**	**6,987,898**	**34,456,876**

Key: OOH – out-of-hours.

Table A25. Itemised budget impact of the implementation of an acute, non-urgent telephone service OOH with 200,000 annual calls (low-demand scenario) staffed by non-clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	6,927,836	7,274,227	7,620,619	7,967,011	8,313,403	38,103,096
Hardware	103,922	5,196	5,196	51,703	5,196	171,214
Software and telecommunications	1,015,403	1,066,173	1,116,944	1,167,714	1,218,484	5,584,718
Office set up	165,323	0	0	16,532	0	181,855
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	65,136	68,393	71,650	74,906	78,163	358,248
Premises rent	330,818	330,818	330,818	330,818	330,818	1,654,091
Total	**11,048,438**	**9,344,808**	**9,745,227**	**10,208,685**	**10,546,064**	**50,893,222**

Key: OOH – out-of-hours.

Table A26. Itemised budget impact of the implementation of an acute, non-urgent telephone service OOH with 200,000 annual calls (low-demand scenario) staffed by clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	6,060,226	6,363,237	6,666,249	6,969,260	7,272,271	33,331,243
Hardware	96,198	4,810	4,810	46,163	4,810	156,791
Software and telecommunications	840,334	882,350	924,367	966,384	1,008,400	4,621,835
Office set up	148,045	0	0	14,804	0	162,849
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	53,906	56,601	59,296	61,992	64,687	296,481
Premises rent	294,860	294,860	294,860	294,860	294,860	1,474,298
Total	**9,933,568**	**8,201,858**	**8,549,581**	**8,953,463**	**9,245,028**	**44,883,498**

Key: OOH – out-of-hours.

Table A27. Itemised budget impact of the implementation of an acute, non-urgent telephone service OOH with 420,000 annual calls (high-demand scenario) staffed by non-clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	12,401,787	13,021,876	13,641,965	14,262,055	14,882,144	68,209,827
Hardware	155,008	7,750	7,750	84,889	7,750	263,148
Software and telecommunications	1,914,093	2,009,798	2,105,503	2,201,207	2,296,912	10,527,514
Office set up	271,135	0	0	27,114	0	298,249
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	122,785	128,924	135,064	141,203	147,342	675,318
Premises rent	553,418	553,418	553,418	553,418	553,418	2,767,092
Total	**17,858,226**	**16,321,767**	**17,043,701**	**17,869,886**	**18,487,567**	**87,581,147**

Key: OOH – out-of-hours.

Table A28. Itemised budget impact of the implementation of an acute, non-urgent telephone service OOH with 420,000 annual calls (high-demand scenario) staffed by clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	10,765,927	11,304,223	11,842,520	12,380,816	12,919,112	59,212,598
Hardware	140,075	7,004	7,004	74,179	7,004	235,264
Software and telecommunications	1,575,626	1,654,407	1,733,188	1,811,970	1,890,751	8,665,941
Office set up	237,429	0	0	23,743	0	261,172
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	101,073	106,127	111,180	116,234	121,288	555,902
Premises rent	480,816	480,816	480,816	480,816	480,816	2,404,082
Total	**15,740,946**	**14,152,577**	**14,774,709**	**15,487,758**	**16,018,971**	**76,174,960**

Key: OOH – out-of-hours.

Table A29. Itemised budget impact of the implementation of an acute, non-urgent telephone service OOH with 710,000 annual calls (high-demand scenario) staffed by non-clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	19,484,662	20,458,895	21,433,128	22,407,361	23,381,594	107,165,641
Hardware	236,972	11,849	11,849	126,250	11,849	398,767
Software and telecommunications	3,069,552	3,223,030	3,376,507	3,529,985	3,683,463	16,882,537
Office set up	428,028	0	0	42,803	0	470,831
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	196,905	206,751	216,596	226,441	236,287	1,082,980
Premises rent	879,100	879,100	879,100	879,100	879,100	4,395,498
Total	**26,735,219**	**25,379,624**	**26,517,180**	**27,811,940**	**28,792,292**	**135,236,254**

Key: OOH – out-of-hours.

Table A30. Itemised budget impact of the implementation of an acute, non-urgent telephone service OOH with 710,000 annual calls (high-demand scenario) staffed by clinical call handlers

Item	Year 1 (€)	Year 2 (€)	Year 3 (€)	Year 4 (€)	Year 5 (€)	Total (€)
Staff	16,920,431	17,766,453	18,612,474	19,458,496	20,304,517	93,062,371
Hardware	221,471	11,074	11,074	115,854	11,074	370,546
Software and telecommunications	2,509,330	2,634,796	2,760,263	2,885,729	3,011,196	13,801,314
Office set up	371,654	0	0	37,165	0	408,820
Public information campaign	2,440,000	600,000	600,000	600,000	600,000	4,840,000
Staff training and support	160,968	169,017	177,065	185,114	193,162	885,326
Premises rent	755,128	755,128	755,128	755,128	755,128	3,775,642
Total	**23,378,983**	**21,936,468**	**22,916,004**	**24,037,487**	**24,875,077**	**117,144,019**

Key: OOH – out-of-hours.

Table A31. Cost per call for scenario analyses

Description of service	Cost per call (€)							
24/7 service	**270,000 annual calls**				**960,000 annual calls**			
	Non-clinical call handlers		Clinical call handlers		Non-clinical call handlers		Clinical call handlers	
Year 1	61.84		54.41		50.61		43.44	
Year 2	53.70		46.40		47.67		40.65	
Year 3	53.54		46.24		47.59		40.58	
Year 4	53.63		46.32		47.72		40.68	
Year 5	53.26		45.98		47.45		40.45	
Years 1-5	55.04		47.72		48.15		41.10	
OOH service	**120,000 annual calls**		**200,000 annual calls**		**420,000 annual calls**		**710,000 annual calls**	
	Non-clinical call handlers	Clinical call handlers	Non-clinical call handlers	Clinical call handlers	Non-clinical call handlers	Clinical call handlers	Non-clinical call handlers	Clinical call handlers
Year 1	71.60	66.65	55.24	49.67	42.52	37.48	37.66	32.93
Year 2	54.19	49.36	44.50	39.06	37.01	32.09	34.04	29.43
Year 3	53.88	49.06	44.30	38.86	36.89	31.98	33.95	29.34

Year 4	53.95	49.10	44.39	38.93	37.00	32.07	34.06	29.44
Year 5	53.34	48.53	43.94	38.52	36.68	31.78	33.79	29.20
Years 1-5	57.06	52.21	46.27	40.80	37.91	32.98	34.63	30.00

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