

**THE ROLE OF HUMAN PAPILLOMAVIRUS VACCINES IN REDUCING
THE RISK OF CERVICAL CANCER IN IRELAND -
A HEALTH TECHNOLOGY ASSESSMENT**



Report Prepared by
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for the Health Information and Quality Authority (HIQA)

TECHNICAL APPENDIX 2

21 FEBRUARY 2008

APPENDIX 2.

Resource utilisation and unit cost data used to estimate the direct medical costs of atypia/CIN 1, CIN 2/3 and invasive cervical cancer.

Table 1. Unit cost data.

Resource Description	Unit cost (€2005)	Source
Hospital visits		
Day case	587	Casemix 2005 ¹
Inpatient bed day	689	Casemix 2005 ¹
Outpatient visit	150	Casemix 2005 ¹
Procedures		
Smear test (includes visit, smear taking and cytology)	140	ICSP/HSE (personal communication)
Cervical biopsy	98	Colposcopy Finance Depts ²
Colposcopy (includes clinic visit)	190	Rash <i>et al.</i> (GSK study) ²
Conisation	178	Rash <i>et al.</i> (GSK study) ²
LLETZ*	355	Rash <i>et al.</i> (GSK study) ²
Lymph node dissection	3,937	Casemix 2005 ¹
Hysterectomy	9,297	Casemix 2005 ¹
Trachelectomy	5,656	Casemix 2005 ¹
Ureteric stent	2,704	Casemix 2005 ¹
Palliative care for cancer of the uterus	4,977	Guest <i>et al.</i> (UK) ³
Diagnostics/Tests		
CT scan	159	HSE (Personal communication)
MRI pelvis	441	HSE (Personal communication)
Pet scan	800	HSE (Personal communication)
Ultrasound	83	HSE (Personal communication)
Medication/Radiotherapy		
Radical radiotherapy	3,840	Casemix 2005 ¹
Cisplatin	668	St James's Hospital Pharmacy (includes pharmacy time and administration costs)
Carboplatin/paclitaxel per course	791	St James's Hospital Pharmacy (includes pharmacy time and administration costs) (Paclitaxel now available as generic hence lower cost)

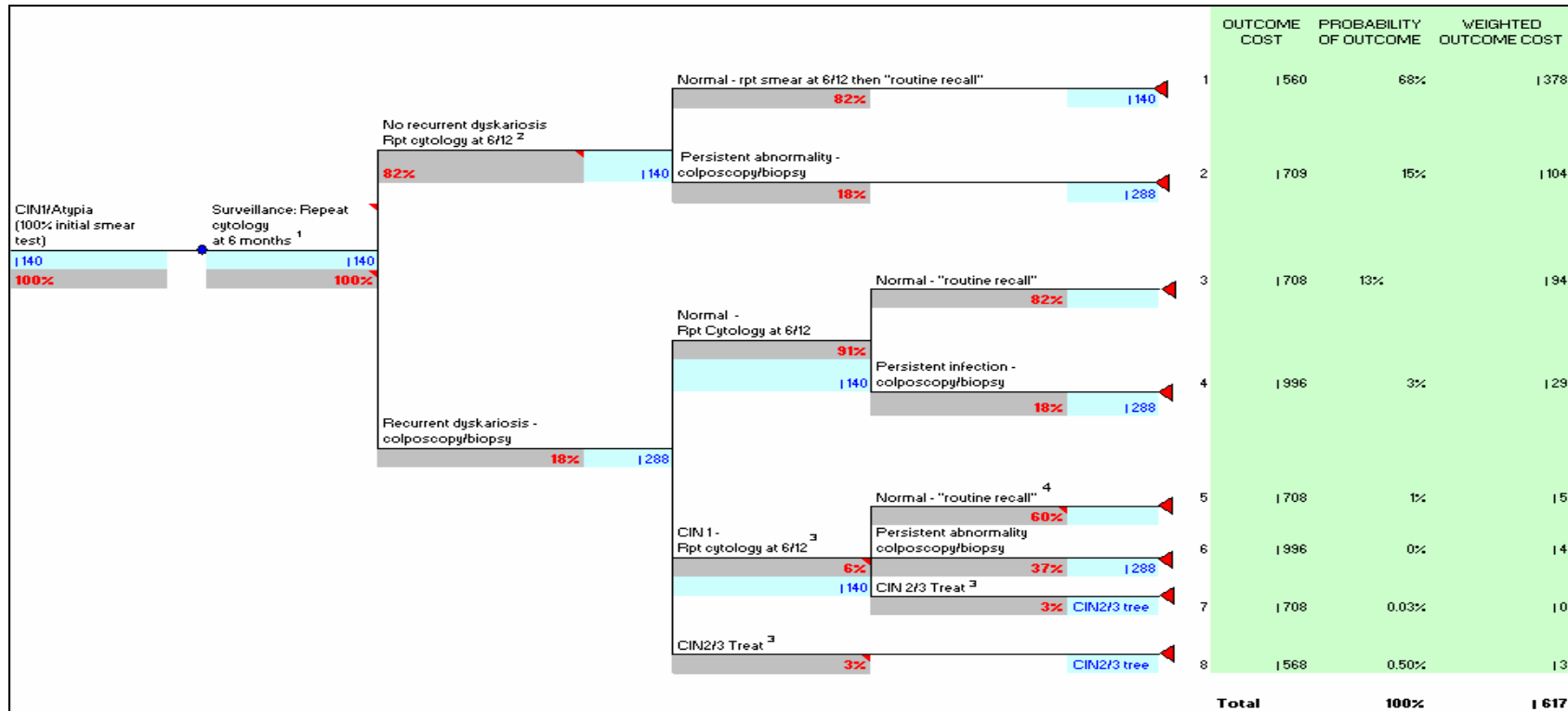
- LLETZ: Large loop excisions of the transformation zone

Source:

1. Health Service Executive (HSE). Ready reckoner of acute hospital inpatient activity and costs (summarised by DRG) relating to 2005 costs and activity. Casemix Unit of the National Hospitals Office. Annual Report 2007, Part 3.
2. Rash R, Prendiville W, Byrne P, et al. The cost of treating and managing abnormal cervical conditions in Ireland. Abstract No PCN39 presented at ISPOR 10th Annual European Congress, Dublin, October 20-23 2007.
3. Guest J, Ruiz F, Greener M, et al. Palliative care treatment patterns and associated costs of healthcare resource use for specific advanced cancer patients in the UK. *Eur J Cancer Care* 2006; 15:65-73.

Figure 1: Direct medical cost of atypia/CIN 1.

Probabilities for each arm of the decision tree are highlighted in red and costs (€) are highlighted in blue. Probabilities always sum up to 1.



Comments:

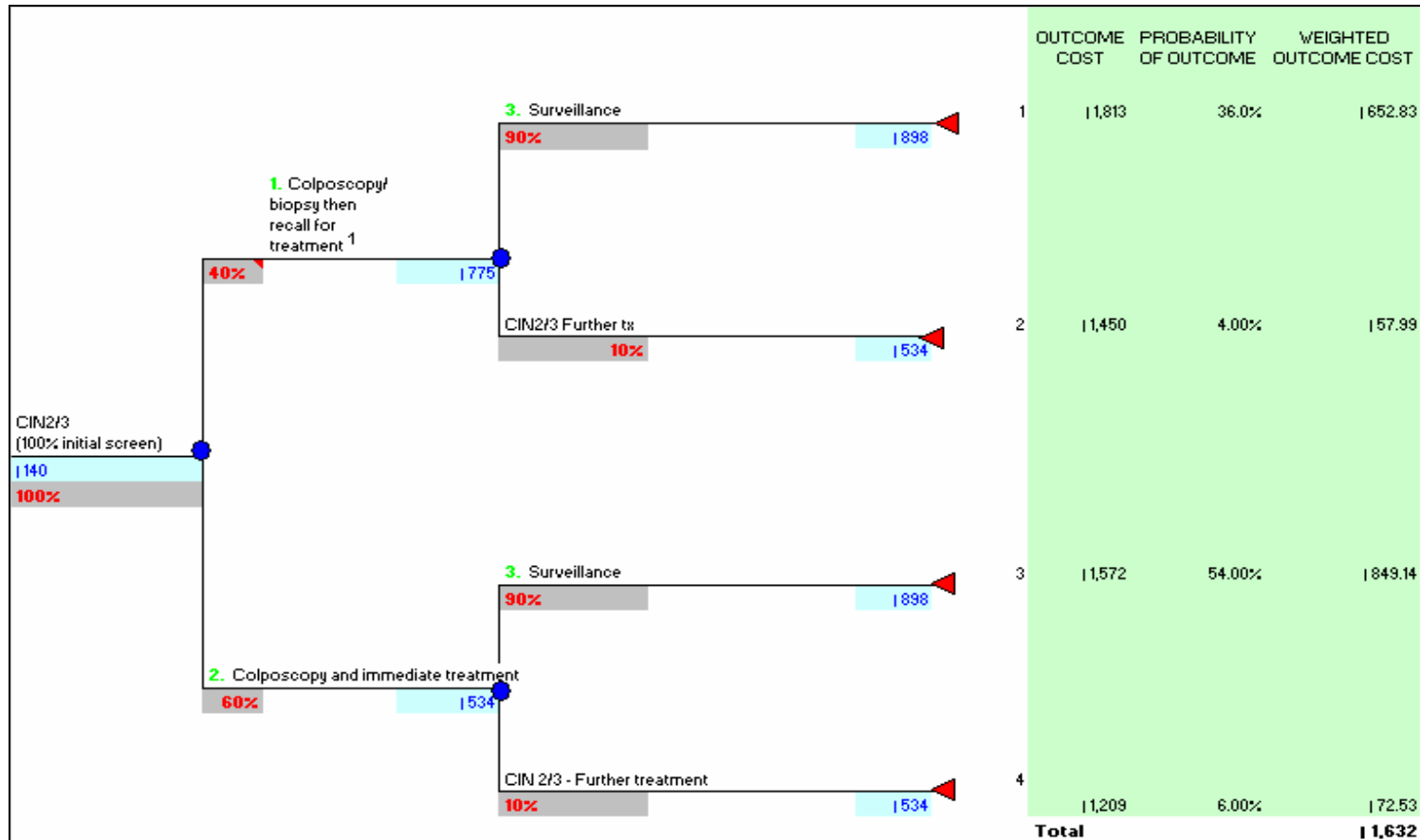
1. Cotton et al. The TOMBOLA group (2006). Cytological surveillance involves 3 repeat smears at 6 monthly intervals. If normal the woman is returned to "routine recall." If the smear shows moderate dyskaryosis or worse, or 3 consecutive inadequate smears then referral is made for colposcopy.
2. Personal communication Prof N Waugh. 82.2% of women randomised to surveillance were not subjected to colposcopy (Results from the TOMBOLA evaluation. In press, 2008).
3. Cotton et al. Abstract 2002. Of women with borderline smears in the year prior to current smears (n=601) 6% showed mild dyskaryosis and 2.8% moderate dyskaryosis.
4. Expert clinical opinion.

Table 2. Resource use and cost data for management of atypia/CIN 1.

Resource description	Probability	Frequency	Unit cost (€)	Total cost (€)
Smear test (100%)				
Smear test	1	1	140	140
Total				140
Persistent infection: colposcopy/biopsy				
Colposcopy (includes clinic visit)	1	1	190	190
Cervical biopsy	1	1	98	98
Total				288

Figure 2. Direct medical cost of CIN 2/3.

Probabilities for each arm of the decision tree are highlighted in red and costs (€) are highlighted in blue. Probabilities always sum up to 1.



Comments:

1. Report on Colposcopy Statistics for HTA for HPV Vaccination. Based on patients attending the Colposcopy Clinic in the National Maternity Hospital, Holles St in 2006 (n=1,370)..

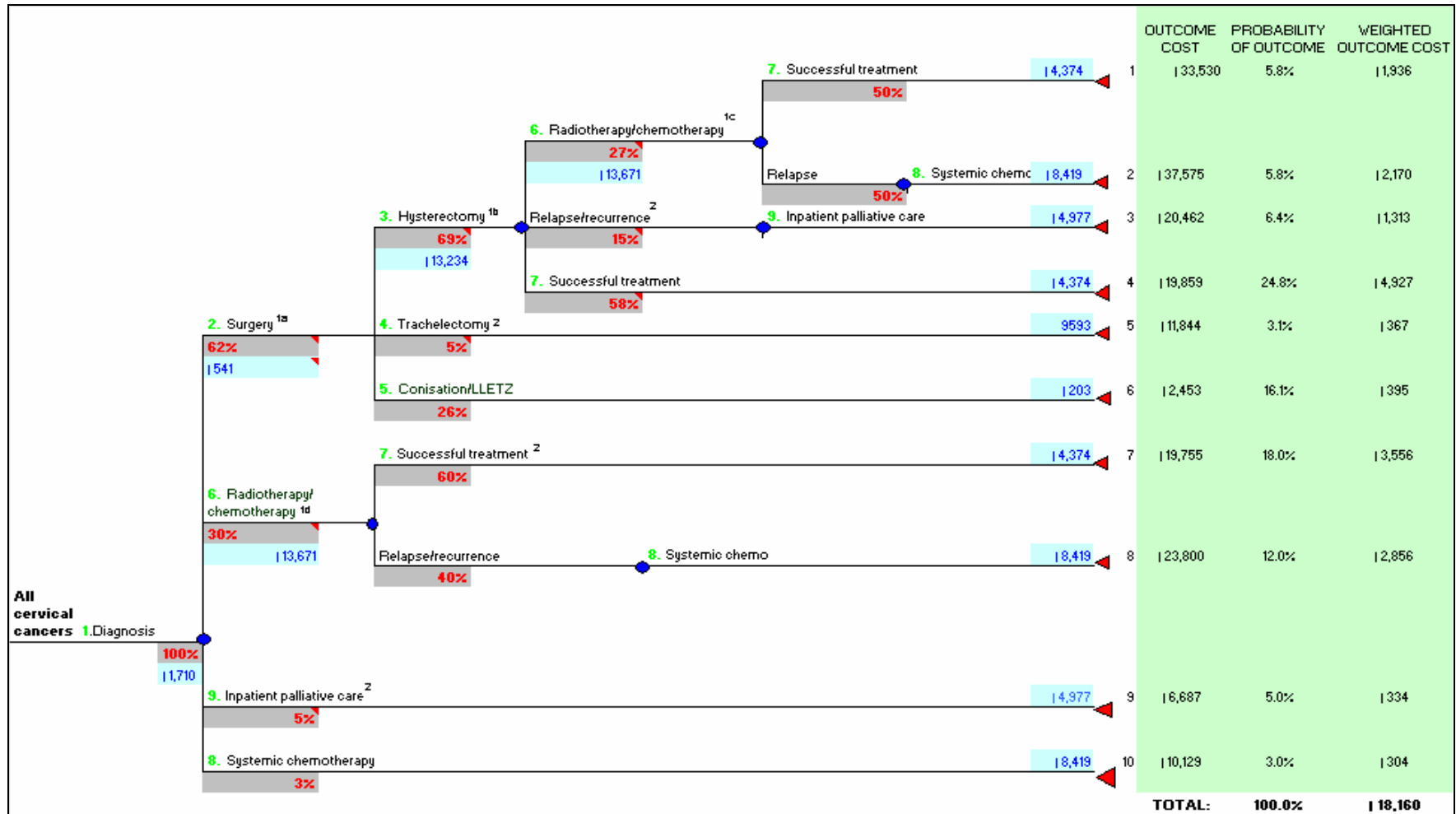
Table 3. Resource use and cost data for management of CIN 2/3.

Resource description	Probability	Frequency	Unit cost (€)	Total cost (€)
1. Colposcopy / biopsy then recall for treatment (40%)				
Colposcopy (+clinic visit)	1	1	190	190
Cervical biopsy	1	1	98	98
Extra Gynaecology Clinic slot	1	1	150	150
Conisation	0.1	1	178	17.8
LLETZ*	0.9	1	355	319.5
Total				775
2. Colposcopy and immediate treatment (60%)				
Colposcopy (+clinic visit)	1	1	190	190
Conisation	0.1	1	178	10.68
LLETZ	0.9	1	355	333.7
Total				534
3. Surveillance				
Check-up outpatient Gynaecologist (after 6 months)	1	1	150	150
Annual GP visit /Smear test (6 smears over 5 years discounted at 3.5%)	1	6	140	748
Total				898

* LLETZ: Large loop excisions of the transformation zone

Figure 3. Direct medical cost of invasive cervical cancer.

Probabilities for each arm of the decision tree are highlighted in red and costs (€) are highlighted in blue. Probabilities always sum up to 1.



Comments:

1. Estimated from National Cancer Registry (NCR) data related to diagnostic or treatment procedures. Based on 619 women diagnosed with invasive cervical cancer, 2002-2004.
 - a. 385 out of 619 patients had any surgery. NCR 2002-2004
 - b. 267 out of 385 surgical cases had any hysterectomy (radical, vaginal, total etc)
 - c. 73 out of 267 surgical cases also had radiotherapy/chemotherapy.
 - d. 189 out of 619 cases had radiotherapy alone/ radiotherapy plus chemotherapy

2. Expert clinical opinion.

Table 4. Resource use and cost data for management of invasive cervical cancer.

Resource Description	Probability	Frequency	Unit cost (€)	Total cost (€)
1. Diagnosis (100%)				
Colposcopy	1	1	190	190
Cervical biopsy	1	1	98	98
CT scan	1	1	159	159
Ultrasound	1	1	83	83
MRI pelvis	0.8	1	441	352.8
PET scan	0.3	1	800	240
Staging (Day case General Anaesthetic)	1	1	587	587
Total				1,710
2. Surgery (62%)				
Ureteric stenting ¹	0.2	1	2,704	541
Total				541
3. Hysterectomy (69%)				
Hysterectomy	1	1	9,297	9,297
Lymph node dissection	1	1	3,937	3,937
Total				13,234
4. Trachelectomy (5%)				
Trachelectomy	1	1	5,656	5,656
Lymph node dissection	1	1	3,937	3,937
Total				9,593
5. Conisation/LLETZ (26%)				
LLETZ	0.14	1	355	49.7
Conisation	0.86	1	178	153.08
Total	1	1	178	203
6. Radiotherapy / chemotherapy (30%)				
Chemotherapy (Cisplatin 70mg/week x 5 weeks)	1	5	668.13	3,341
Radiotherapy	1	1	3,840	3,840
Outpatient visit ²	0.95	25	150	3,562.5
Inpatient bed days ²	0.05	25	689	861.25
1 inpatient day per cycle of radiotherapy ³	1	3	689	2,067
Total				13,671
7. Successful treatment⁴				
Outpatient follow-up years 1-3: 4visits/year; years 4-5: 2 visits/year; years 6-10: 1 visit/year				
Total (Including annual discount rate 3.5%)				4,374
8. Systemic chemotherapy				
Carboplatin/Paclitaxel	1	5	791	3,953.8
Relapse: repeat course Carboplatin/Paclitaxel	0.5	5	790.76	1,976.9
Palliative care for cancer of the uterus	0.5	1	4,977	2,489
Total				8,419
9. Inpatient palliative care				
Total	1	1	4,977	4,977

Source:

1. Expert clinical opinion. 20% of patients undergoing surgery have a ureteric stent.
2. Radiotherapy - 95% seen as outpatients. Personal communication St Luke's Hospital, Nov 2007.
3. All patients are treated with chemo/RT for 6 weeks then on weeks 7,8, 9 they get high-dose RT and spend 1 night in hospital each week. Personal communication St Luke's Hospital, Nov 2007.
4. Petignat P, Roy M. Diagnosis and management of cervical cancer. BMJ 2007; 335: 765-768.