



UK Health
Security
Agency

Appendix 7. Methods for estimating secondary care costs

October 2024

Contents

Overview of approach	3
References.....	6
Abbreviations	7

Overview of approach

All secondary care costs are presented inflated to 2022 to 2023 prices using the NHS Cost Inflation Index outlined in the [Unit Costs of Health and Social Care 2023 Manual](#).

Our analysis uses methods originally developed to estimate the overall secondary care costs attributable to infectious diseases (1). The process involves:

- identifying the International Classification of Diseases, Tenth Revision (ICD-10) codes relevant to STIs
- extracting admissions with primary diagnoses (in any episode of care) that have ICD-10 codes relevant to sexually transmitted infections (STIs)
- categorising admissions by STI or related harm.
- costing these admissions using national tariff and national cost collection data, plus an average cost per bed day for admissions with an Healthcare Resource Group (HRG) code not included in these datasets
- estimating the costs attributable to STIs by weighting the cost of harms by the population attributable fraction, or proportion of the harms estimated to be caused by STIs

Note that in all cases, we have used deliberately conservative estimates.

[Table 1](#) shows the STIs and harms included in the analysis, the corresponding ICD-10 code category, and the population attributable fractions and sources from which these are derived. Unless otherwise specified in the table, we include all codes within the code category.

Note that there is some uncertainty about the proportion of pelvic inflammatory disease (PID), ectopic pregnancy and tubal factor infertility (TFI) caused by gonorrhoea and *Mycoplasma genitalium*. For PID, we take the mid-point of the ranges provided in a recent [National Institute for Health and Care Excellence \(NICE\) evidence review](#). No robust estimates of the proportion of ectopic pregnancy and TFI caused by gonorrhoea and *Mycoplasma genitalium* were identified, so we assume that the progression rate from PID to ectopic pregnancy and TFI is the same for all PID caused by STIs, by applying the ratios of ectopic pregnancy and TFI to PID that we observe for chlamydia (2).

Tables 1a to 1d. Inputs to secondary care costing analysis

Table 1a. STIs and associated harms included in estimate of total costs

STI or related harm	ICD-10 code category	Population attributable fraction (PAF) to STIs	Source for PAF
Chancroid	A57	100%	Not applicable
Chlamydia	A56	100%	Not applicable
Donovanosis	A58	100%	Not applicable
Herpes	A60, A63	100%	Not applicable
Gonorrhoea	A54	100%	Not applicable
Lymphogranuloma venereum	A55	100%	Not applicable
Mpox	B04	92%	(3)
Other STIs	A63 (excluding A630), A64	100%	Not applicable
Syphilis: congenital	A50	100%	Not applicable
Syphilis: adult	A51, A52, A53	100%	Not applicable
Trichomoniasis	A59	100%	Not applicable
Ectopic pregnancy	O00	9.9% female	(2)
PID	N70, N71, N72, N73, N74	39.7% female	(2) (4)
TFI	N971	57.8%	(5)

Table 1b. Other harms not included in estimate of total costs

STI or related harm	ICD-10 code category	Population attributable fraction (PAF) to STIs	Source for PAF
Orchitis and epididymitis	N45	0%	No robust source identified
Proctitis	K512	0%	No robust source identified
Urethritis	N34	0%	No robust source identified

Table 1c. HIV

STI or related harm	ICD-10 code category	Population attributable fraction (PAF) to STIs	Source for PAF
HIV disease resulting in disease and other conditions	B20, B21, B22, B23, B24	100%	Not applicable
Other codes stating HIV as cause	O987, R75, R75X, Z114, Z206, Z21, Z21X, Z717, F024, Z830	100%	Not applicable

Table 1d. HPV-related conditions

STI or related harm	ICD-10 code category	Population attributable fraction (PAF) to STIs	Source for PAF
Anogenital (venereal) warts	A630	100%	Not applicable
Anal cancer	C21	88.6% male, 92.5% female	(6)
Cervical cancer	C53	99.7% female	(6)
Nasopharynx cancer	C11	80.0% male, 80.0% female	(6)
Penile cancer	C60	63.3% male	(6)
Pharynx cancer	C09, C10, C11, C14	72.4% male, 63.3% female	(6)
Vaginal cancer	C52	75.0% female	(6)
Vulval cancer	C51	68.8% female	(6)

References

1. Chi and others. [‘What is the overall burden and cost of infections on NHS hospitals? An analysis of the Hospital Episodes Statistics’ Admitted Patient Care data’](#) (due to be published)
2. Price MJ, Ades AE, Soldan K, Welton NJ and others. [‘The natural history of Chlamydia trachomatis infection in women: a multi-parameter evidence synthesis’](#). Health Technology Assessment 2016: volume 20, issue 22, pages 1 to 250 (viewed on 20 September 2021)
3. Allan-Blitz LT and Klausner JD. [‘Current evidence demonstrates that monkeypox is a sexually transmitted infection’](#). Sexually Transmitted Diseases 2023: volume 50, issue 2, pages 63 to 65 (viewed on 20 September 2021)
4. NICE. [‘Background information: causes of pelvic inflammatory disease’](#). 2024 (viewed on 20 September 2021)
5. Ades AE, Price MJ, Kounali D, Akande VA and others. [‘Proportion of tubal factor infertility due to chlamydia: finite mixture modeling of serum antibody titers’](#). American Journal of Epidemiology 2017: volume 185, issue 2, pages 124 to 134 (viewed on 20 September 2021)
6. Brown KF, Rungay H, Dunlop C, Ryan M and others. [‘The fraction of cancer attributable to modifiable risk factors in England, Wales, Scotland, Northern Ireland, and the United Kingdom in 2015’](#). British Journal of Cancer 2018: volume 118, issue 8, pages 1,130 to 1,141 (viewed on 20 September 2021)

Abbreviations

Abbreviation	Meaning
HRG	Healthcare Resource Group
ICD-10	International Classification of Diseases, Tenth Revision
NICE	National Institute for Health and Care Excellence
PAF	population attributable fraction
PID	pelvic inflammatory disease
STI	sexually transmitted infection
STIs	sexually transmitted infections
TFI	tubal factor infertility
UKHSA	UK Health Security Agency

About the UK Health Security Agency (UKHSA)

UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

[UKHSA](#) is an executive agency, sponsored by the [Department of Health and Social Care](#).

© Crown copyright 2024
Version 1.0

Prepared by: Eleanor Bell, Y-Ling Chi, Kate Soldan.
For queries relating to this document, please contact: Eleanor.Bell@ukhsa.gov.uk

Published: October 2024
Publishing reference: GOV-17362



You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence, visit [OGL](#). Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.



UKHSA supports the Sustainable Development Goals

