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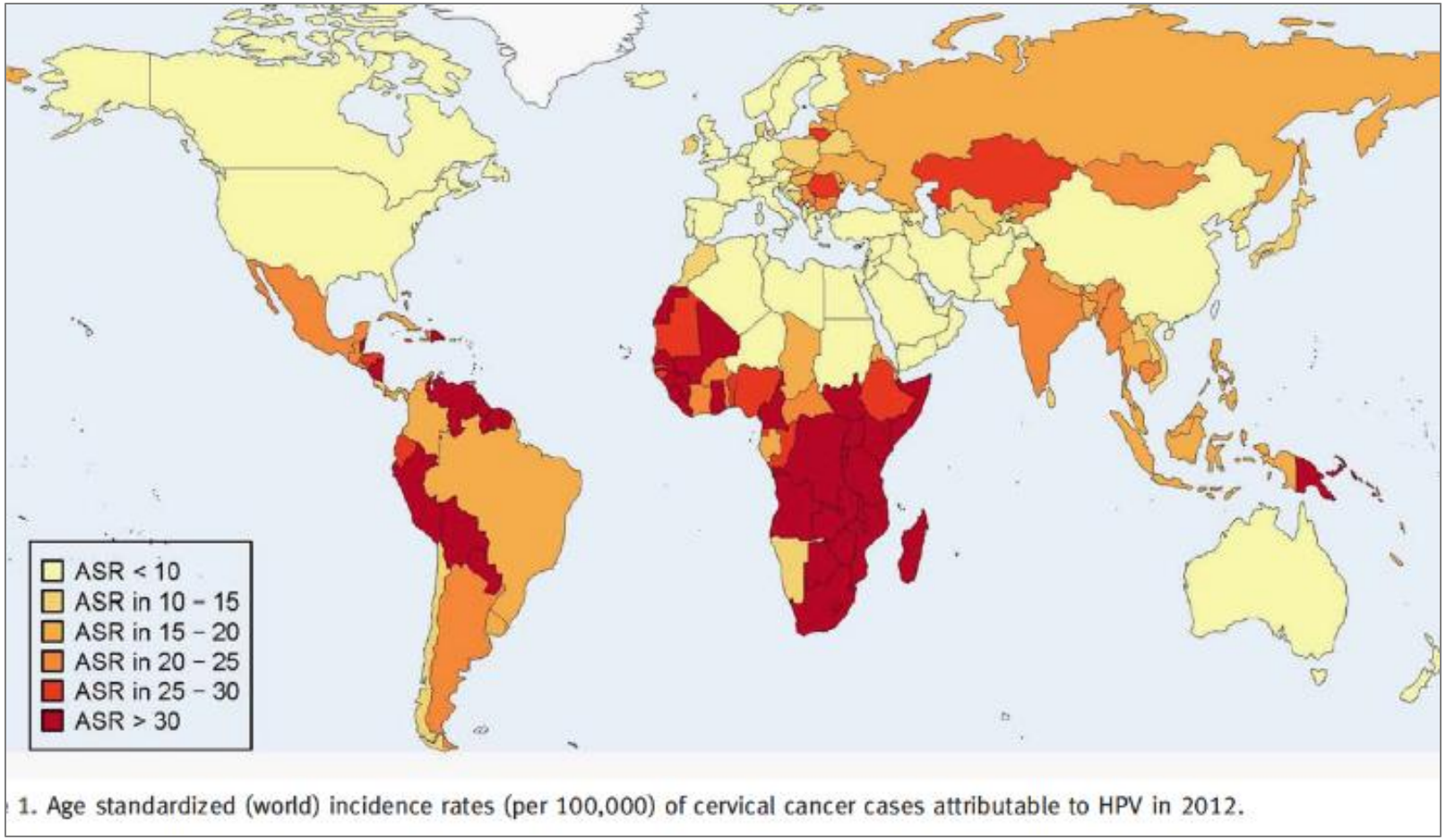
Part 1

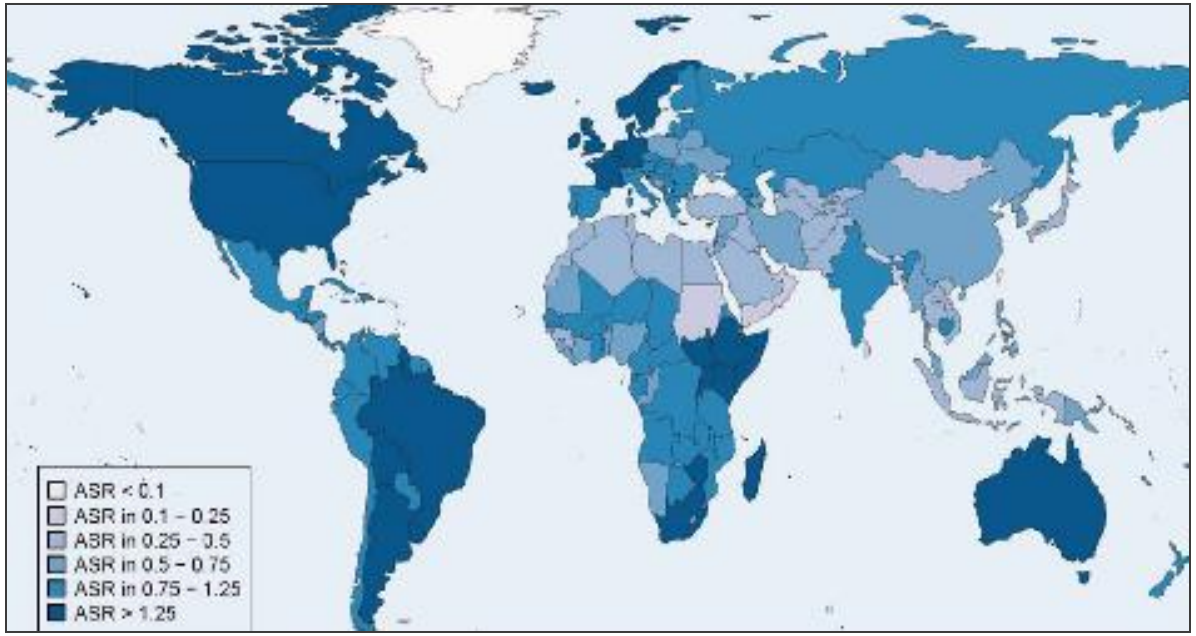
HPV-associated cancers (plus slide on HPV)

Of all HPV cancers, cervical cancer (CC) is still the largest problem

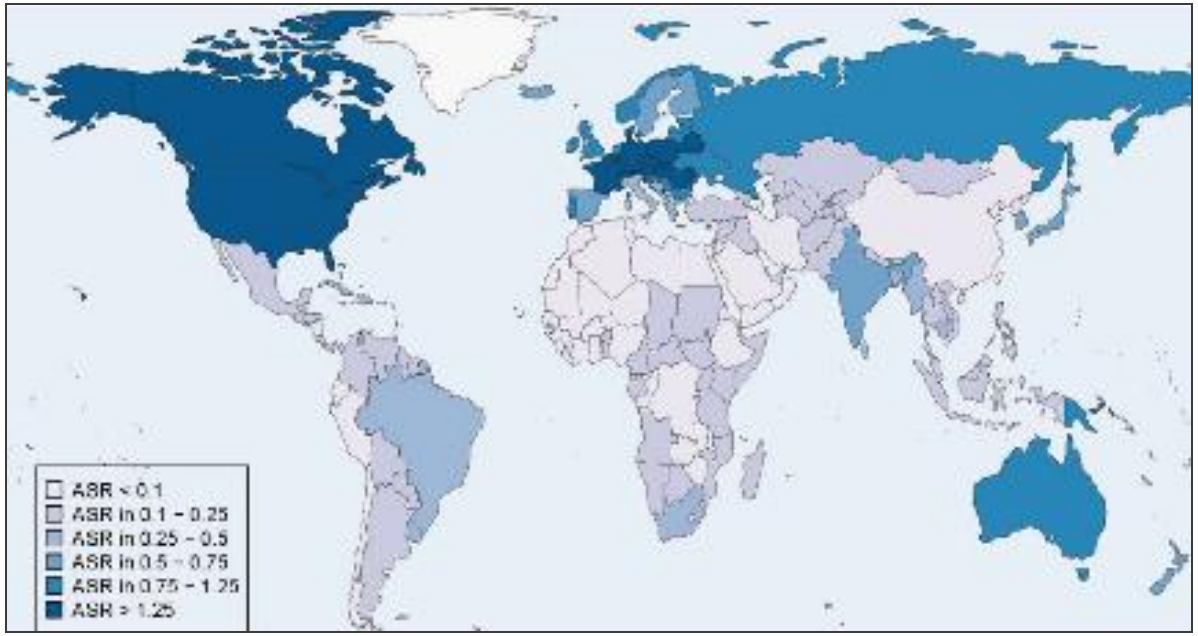


1. Age standardized (world) incidence rates (per 100,000) of cervical cancer cases attributable to HPV in 2012.

Other HPV cancers: NL ‘ahead’



vulva, vagina, anus, penis



oral cavity, oropharynx, larynx

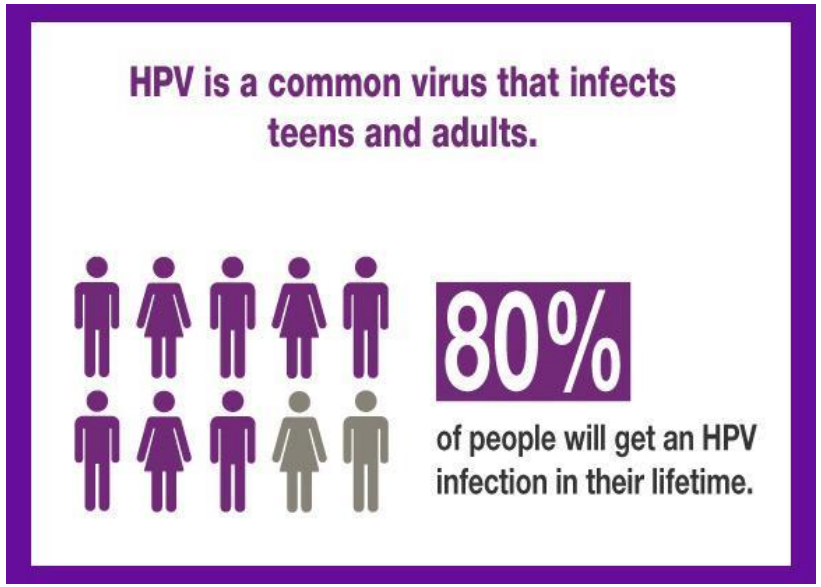
Global burden of HPV-associated cancers

Table 3. Relative contribution of HPV 16/18 or HPV6/11/16/18/31/33/45/52/58 to HPV-associated cancers by site and by sex; World, 2012

HPV-related cancer site (ICD-10 code)	Number attributable to HPV[1]	Relative contribution of HPV16/18[2]		Relative contribution of HPV6/11/16/18/31/33/45/52/58[2]	
		Percent	Number	Percent	Number
Cervix uteri (C53)	530,000	70.8	370,000	89.5	470,000
Anus (C21)	35,000	87.0	30,000	95.9	33,000
Vulva (C51)	8,500	72.6	6,200	87.1	7,400
Vagina (C52)	12,000	63.7	7,400	85.3	9,900
Penis (C60)	13,000	70.2	9,100	84.6	11,000
Head and neck (C01-06, C09-10, C32)	38,000	84.9	32,000	89.7	34,000
Total HPV-related sites in women	570,000	71.4	410,000	89.6	510,000
Total HPV-related sites in men	60,000	82.3	50,000	90.4	55,000
Total HPV-related sites	630,000	72.4	460,000	89.7	570,000

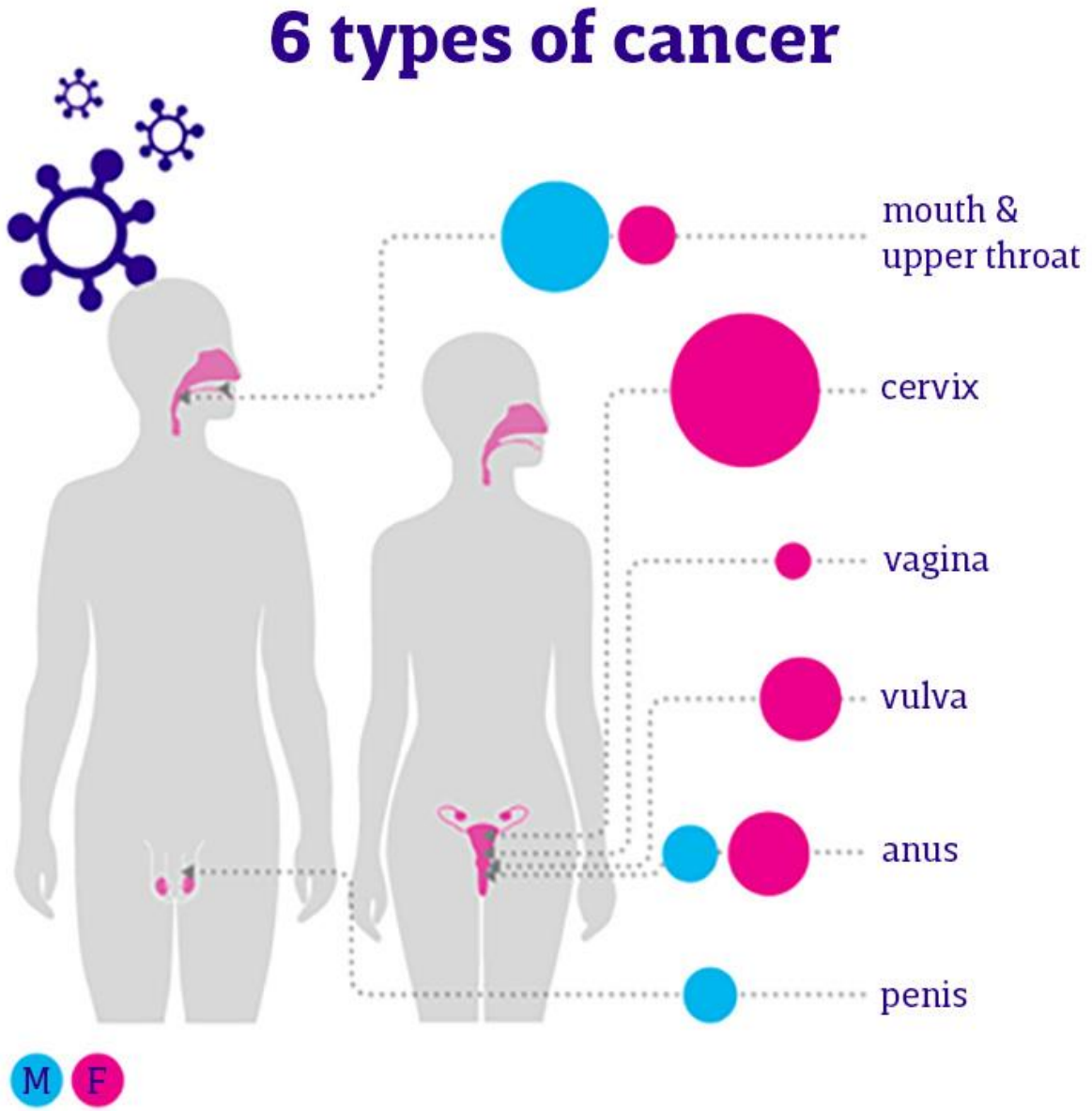
[1]Derived from Plummer, de Martel *et al.*[8]; numbers are rounded to two significant digits.
[2]Derived from Serrano *et al.*,[14] Alemany *et al.*[12] and Castellsague *et al.*[13]

The Human Papilloma Virus (HPV)



- It takes 10-15 years after HPV infection before cancer might arise.
- Often, there are precursor stages that can be screened for and treated, for example via population screening for cervical cancer.
- At least 80% of all men and women will be infected with HPV at some point in their life.
- Most people get rid of the virus; when this is unsuccesful, cancer might arise.

HPV is responsible for 5% of all cancer incidences

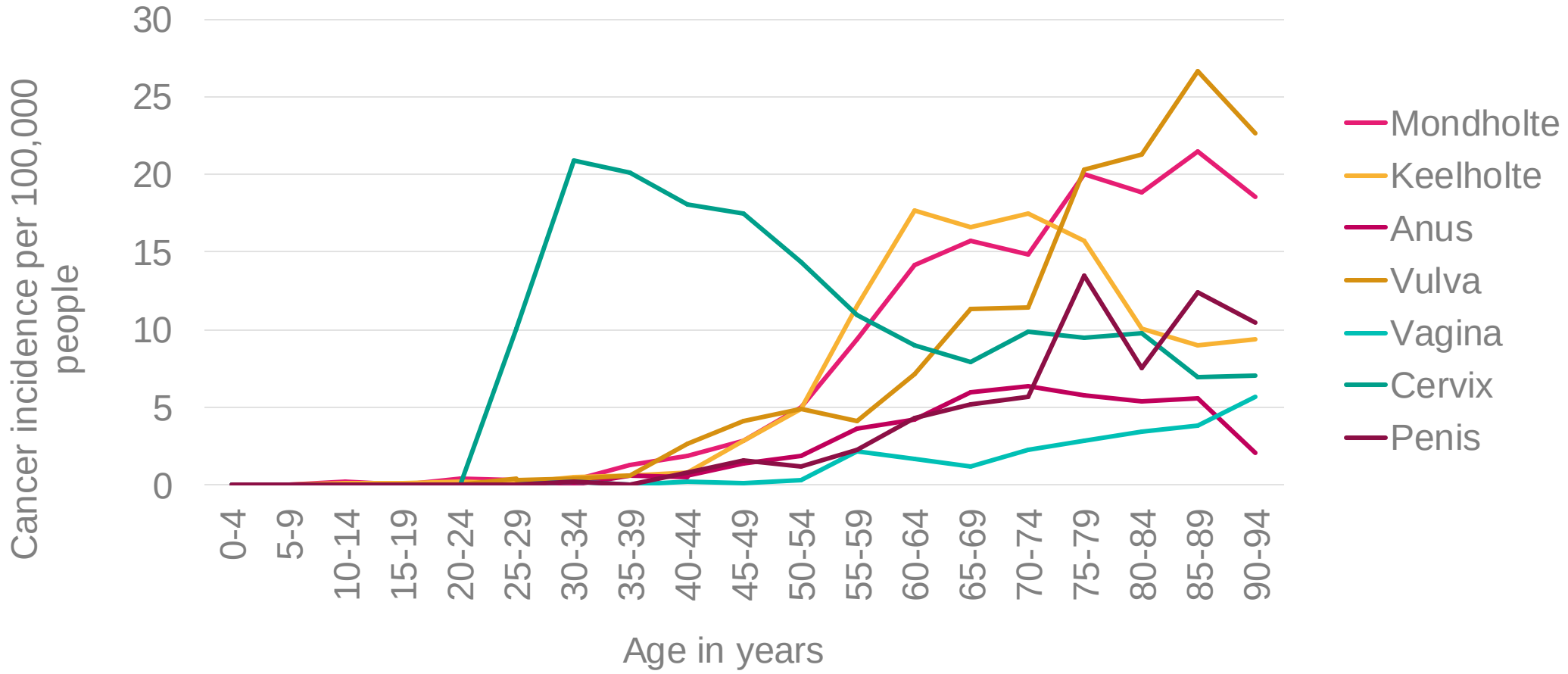


Avoidable HPV-associated cancers in NL

type of cancer	incidence 2017 (n)	mortality 2017 (n)	percentage HPV cancer (%)	HPV cancer mortality (%)
cervix	773	206	100	206
vagina	51	18	70	12
vulva	407	114	43	49
anus	241	59	88	51
penis	164	34	50	17
mouth & throat	1.852	597	78	232
total	3.488	1.028		567

Source: iknl.nl/kankersoorten/baarmoederhalskanker

Age-related incidence of HPV cancer in The Netherlands (2018)



Source: Nederlandse Kankerregistratie (NKR), IKNL

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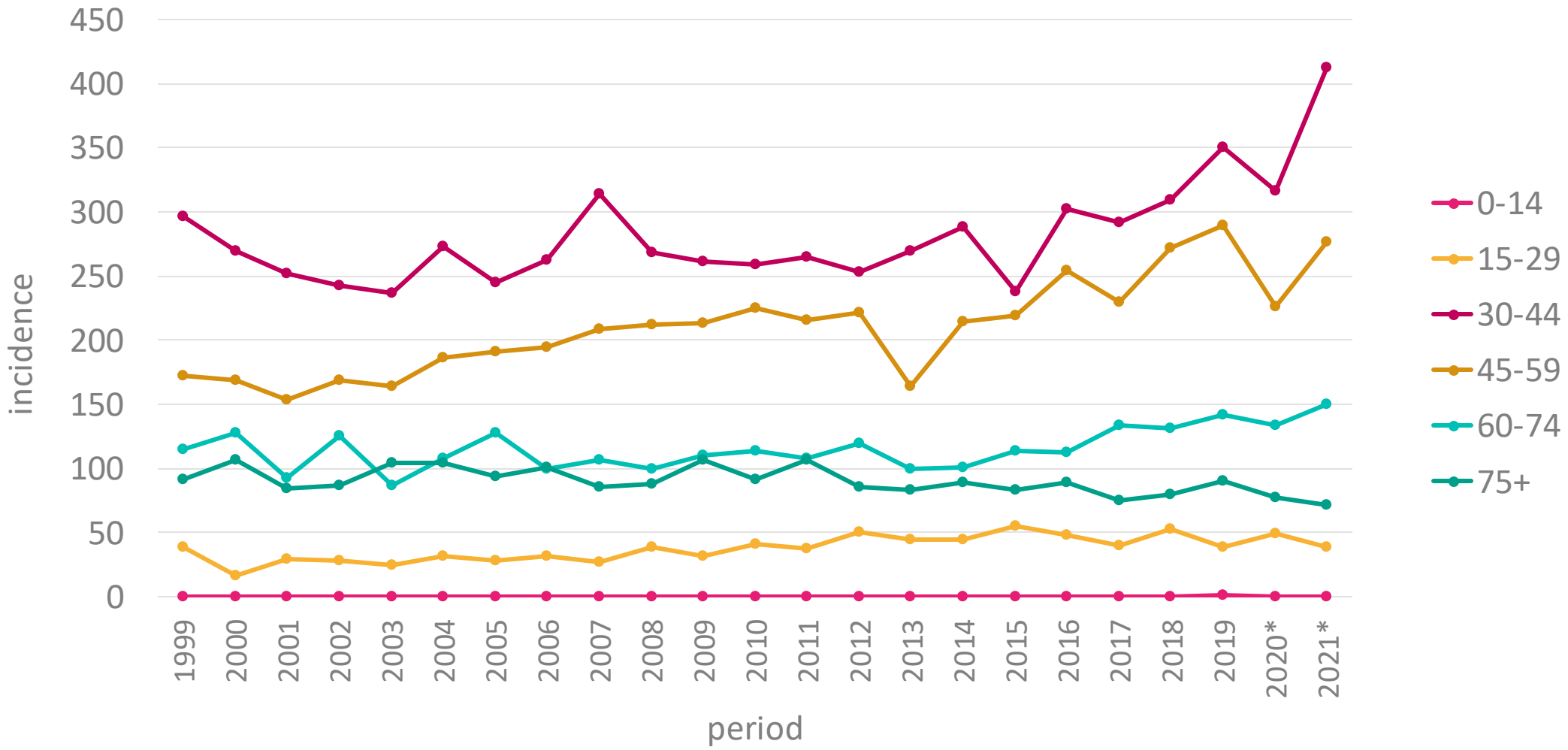
Cervical cancer incidence in The Netherlands



Source: IKNL

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Cervical cancer is a preventable disease

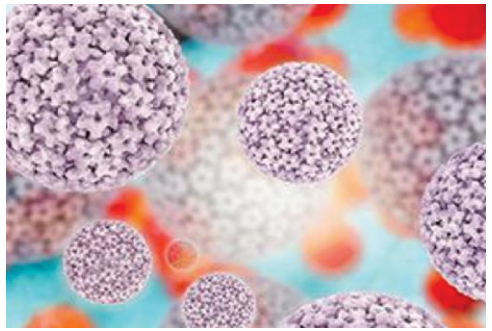
- 9 out of 10 women who die from cervical cancer are in poor countries.
- If we don’t act, deaths from cervical cancer will rise by almost 50% by 2030.
- We have the tools to turn that commitment into a reality. But crucially, we also need the political commitment.
- To succeed, we need everyone on board.

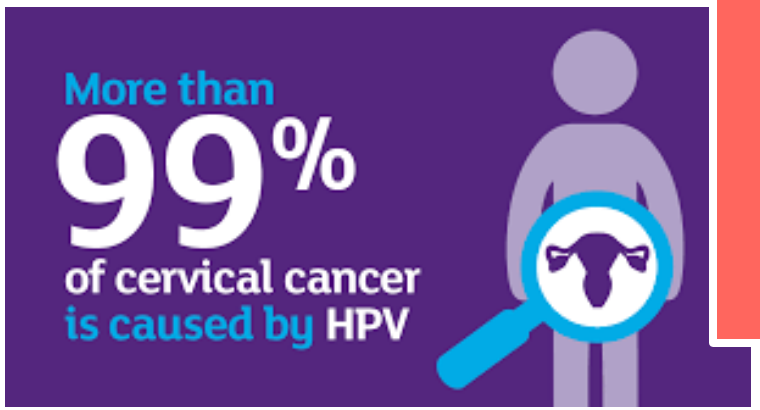
Part 2

Prevention options

Cervical cancer prevention

- **Primary**: vaccination.
- **Secondary**: population screening for cervical cancer.
- **'Tertiary'**: treatment of cervical cancer.

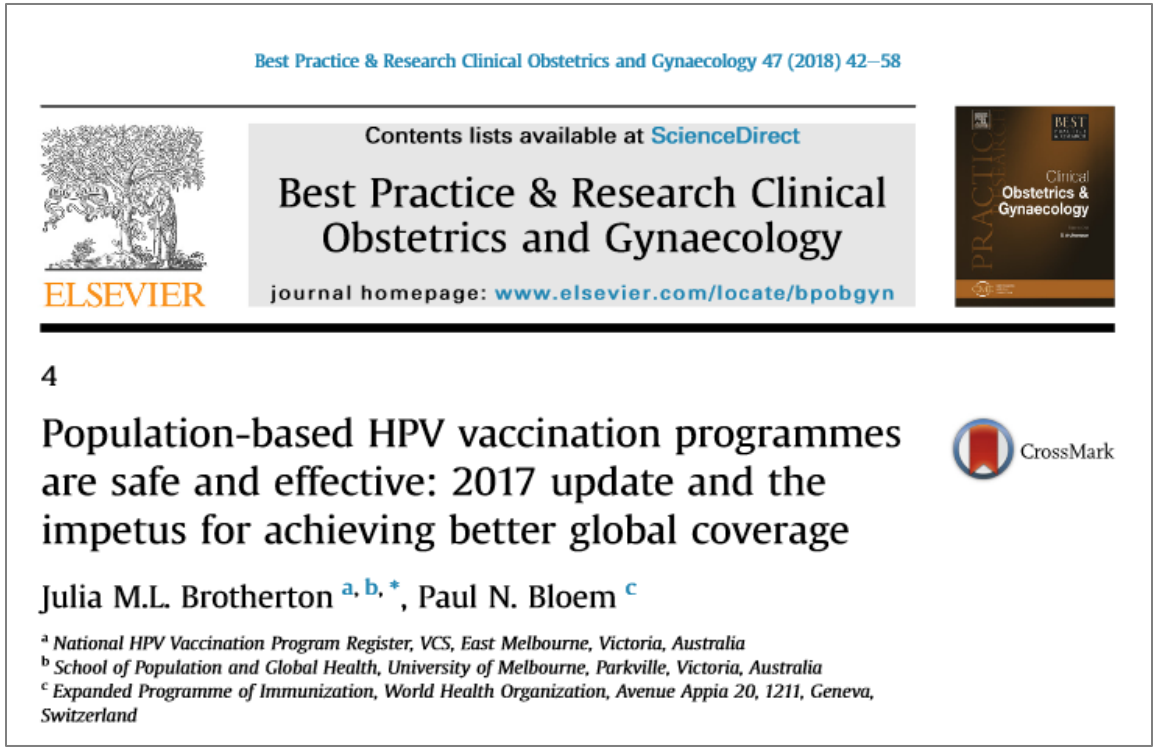




Prevention options

- **Primary:**
  1. Bivalent vaccine
  2. Quadrivalent vaccine
  3. Nonavalent vaccine
  4. Mitigation of other causes (i.e. smoking)
- **Secondary:**
  1. HPV-based screening
  2. Cytology-based screening

The vaccine is safe



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journal homepage: www.elsevier.com/locate/bpobgyn

4

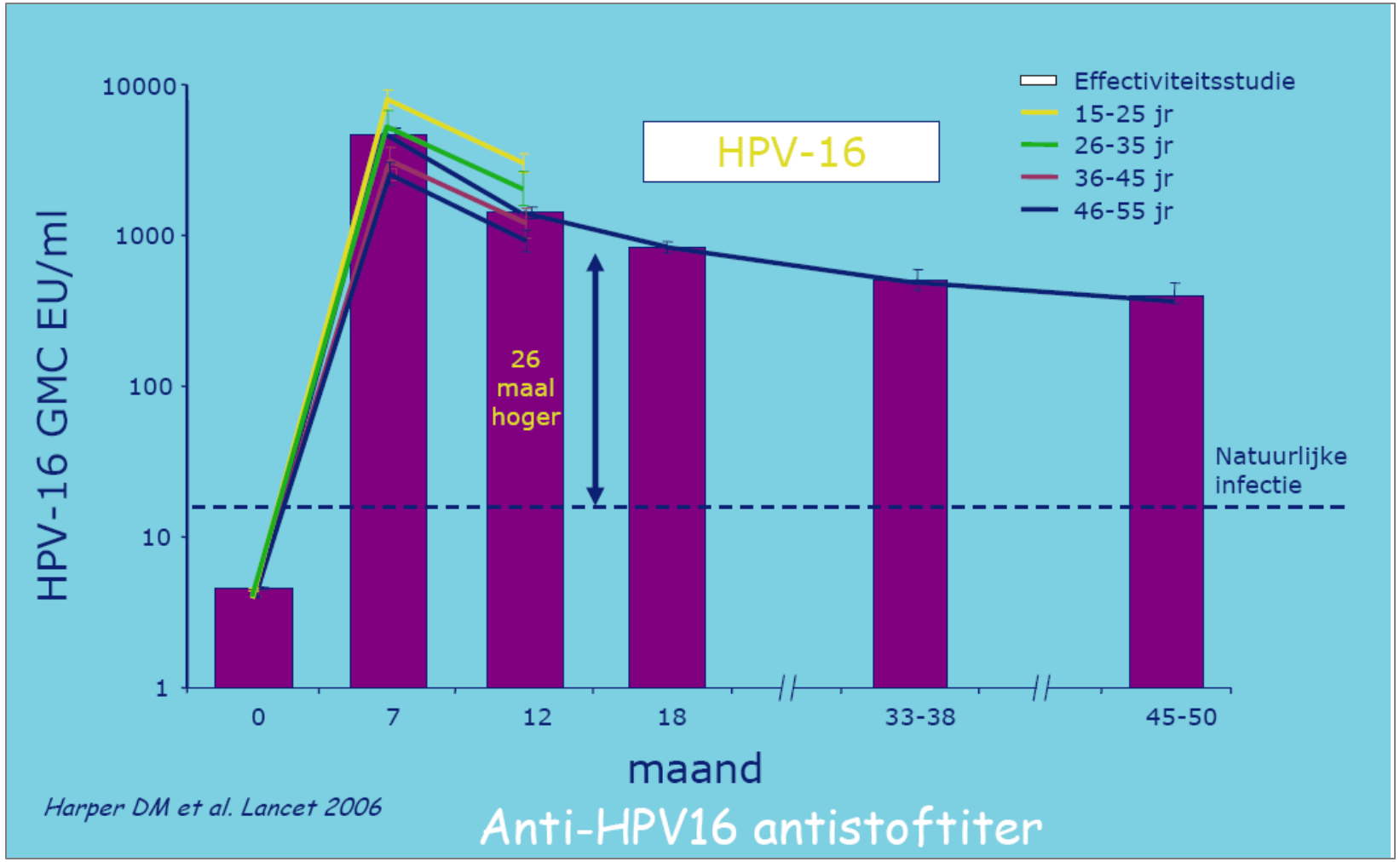
Population-based HPV vaccination programmes are safe and effective: 2017 update and the impetus for achieving better global coverage

Julia M.L. Brotherton [a, b, *], Paul N. Bloem [c]

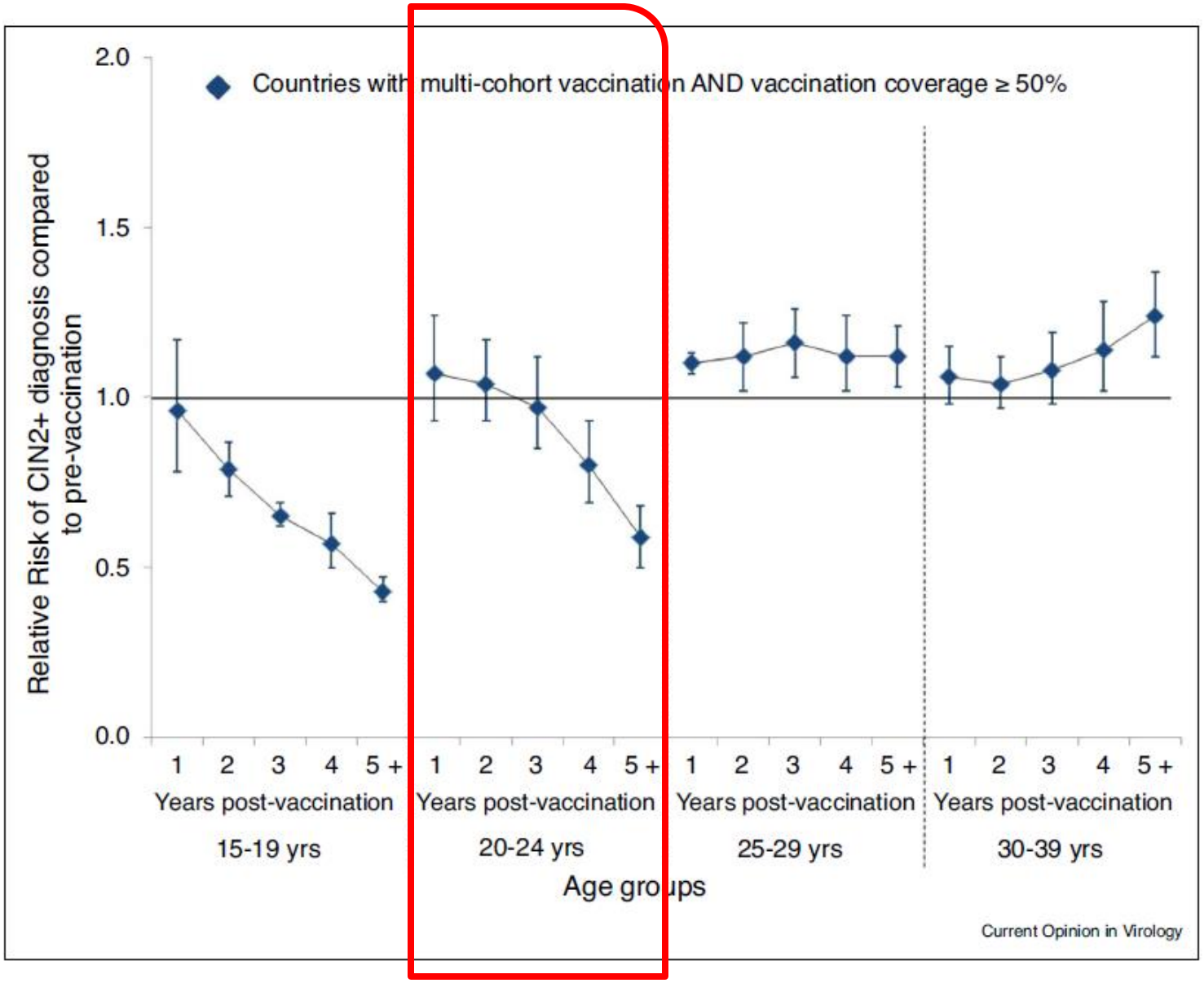
[a] National HPV Vaccination Program Register, VCS, East Melbourne, Victoria, Australia
[b] School of Population and Global Health, University of Melbourne, Parkville, Victoria, Australia
[c] Expanded Programme of Immunization, World Health Organization, Avenue Appia 20, 1211, Geneva, Switzerland

- The HPV vaccine is used in over a 100 countries.
- More than 270 million doses have been administered since 2017.
- GAVI (Global Alliance for Vaccin): ‘safe vaccine’.
- Complex regional pain syndrome (CRPS) and postural orthostatic tachycardia syndrome (POTS) do not occur more often.

Antibodies against HPV after vaccination



The vaccine is also effective in older age groups: ‘catching up’ helps



The vaccine causes a significant decrease of cervical cancer (I)

- **Sweden** (*NEJM*, 2020): less carcinomas
- First study demonstrating that a ‘vaccine before age 17’ means ‘less cervical cancer at age 27’.
- **Also an effect** of vaccination at older age.

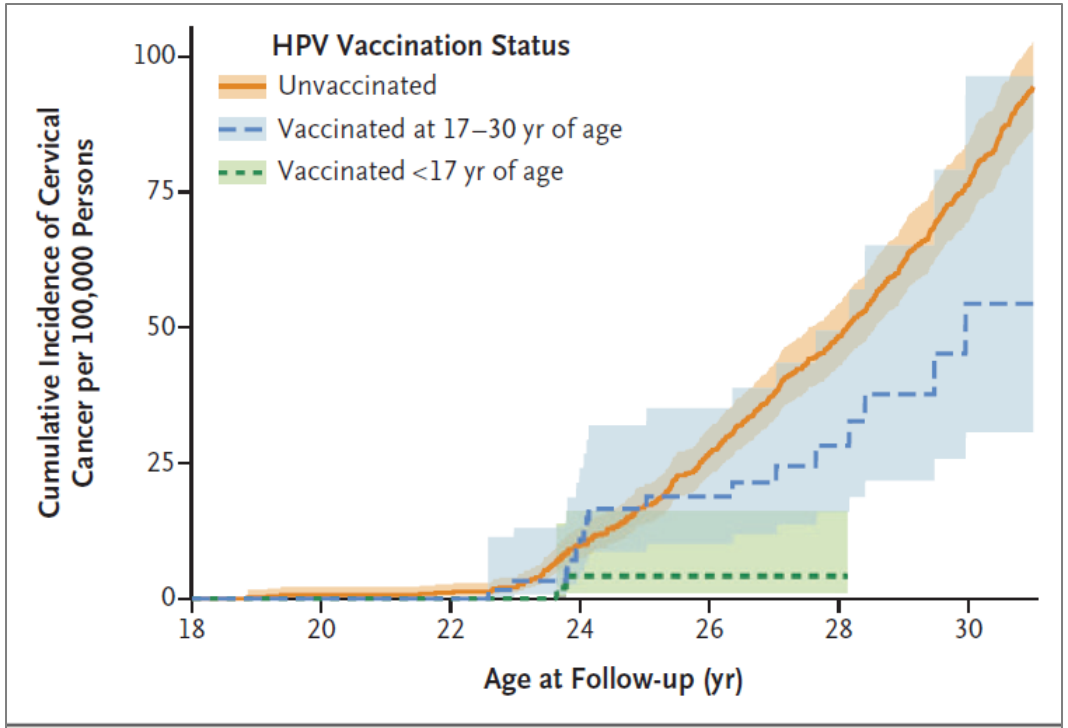


Figure 2. Cumulative Incidence of Invasive Cervical Cancer According to HPV Vaccination Status.

Age at follow-up is truncated in the graph because no cases of cervical cancer were observed in girls younger than 18 years of age.

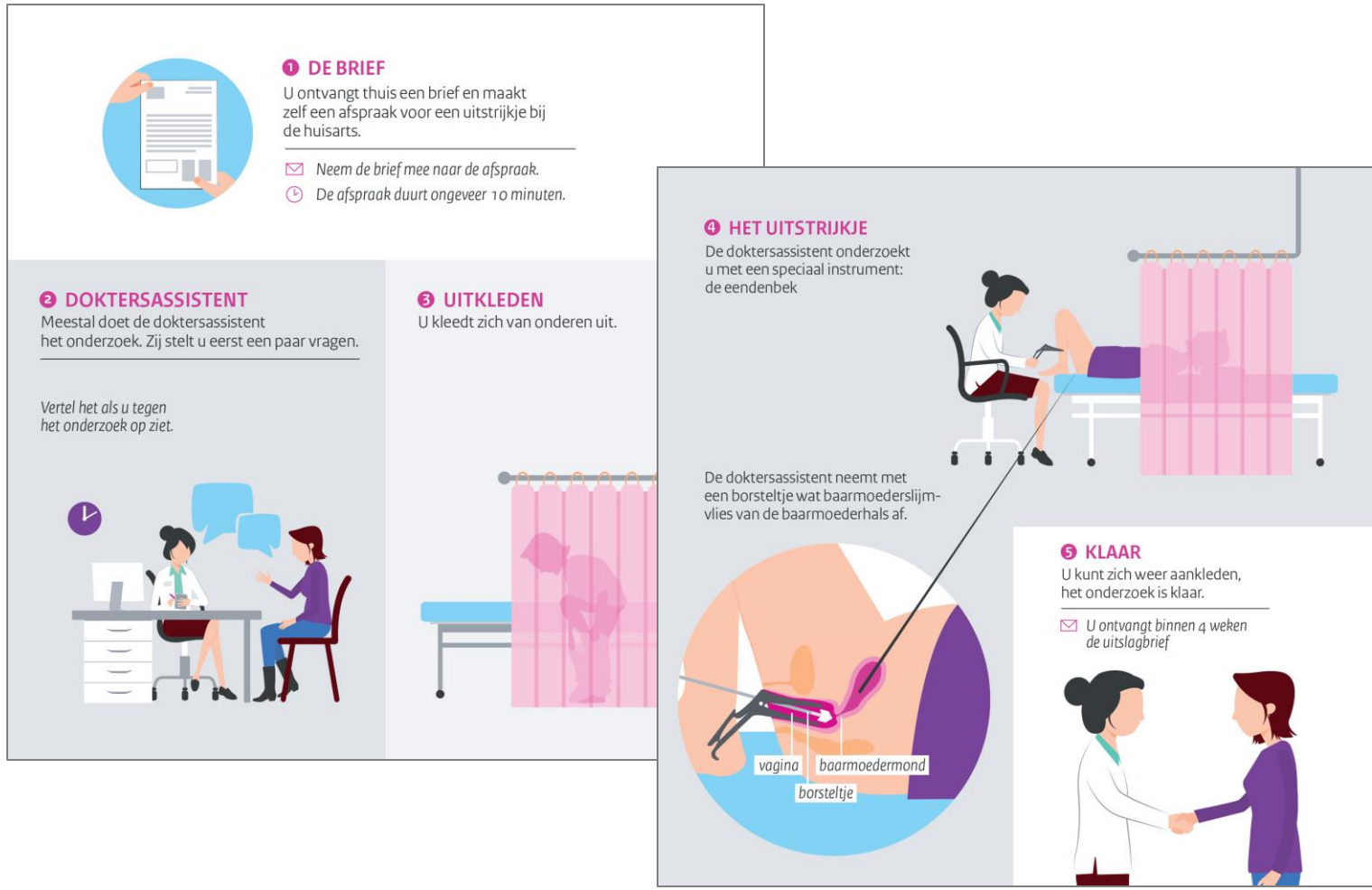
The vaccine causes a significant decrease in cervical cancer (II)

- **Scotland** (*BMJ*, 2019): 89% reduction in CIN3+ (95% CI 81-94%) thanks to HPV vaccination. Vaccination was highest in the yougest age group.
- **England** (*The Lancet*, 2021): first Cervarix, sinds 2012 quadrivalent vaccine. In total 13,7 million years FU of women between age 20-30. Reduction of both CIN3 and cervix carcinoma in all groups. Reduction was dependent on the age the vaccine was administered:

  Reduction cervix carcinoma: 35% (16-18y), 62% (14-16y), 87% (12-13y)
  Reduction CIN3: 39% (16-18y), 75% (14-16y), 97% (12-13y)

Screening for cervical cancer (CC)

- CC screening program in The Netherlands between age 30-60.
- Pap smear via general practice doctor: first HPV test, pap smear when HPV+.
- Or self test; when HPV+, to general practice doctor for pap smear.



Source: RIVM

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Prevention participation in The Netherlands

- Participation population screening: 54.8%; over 5 years: 71.7% (2021).
- Vaccination coverage of girls age 14: 66.4% (2022).
- Screening effect: without screening, every year 1,300 women would be diagnosed.
- The regular population screening gives a reduction of 700 incidences and 235 fatalities (based on MISCAN models).

Sources: Rijksvaccinatieprogramma, Monitor BVO BMHK

Population screening participation in 2020

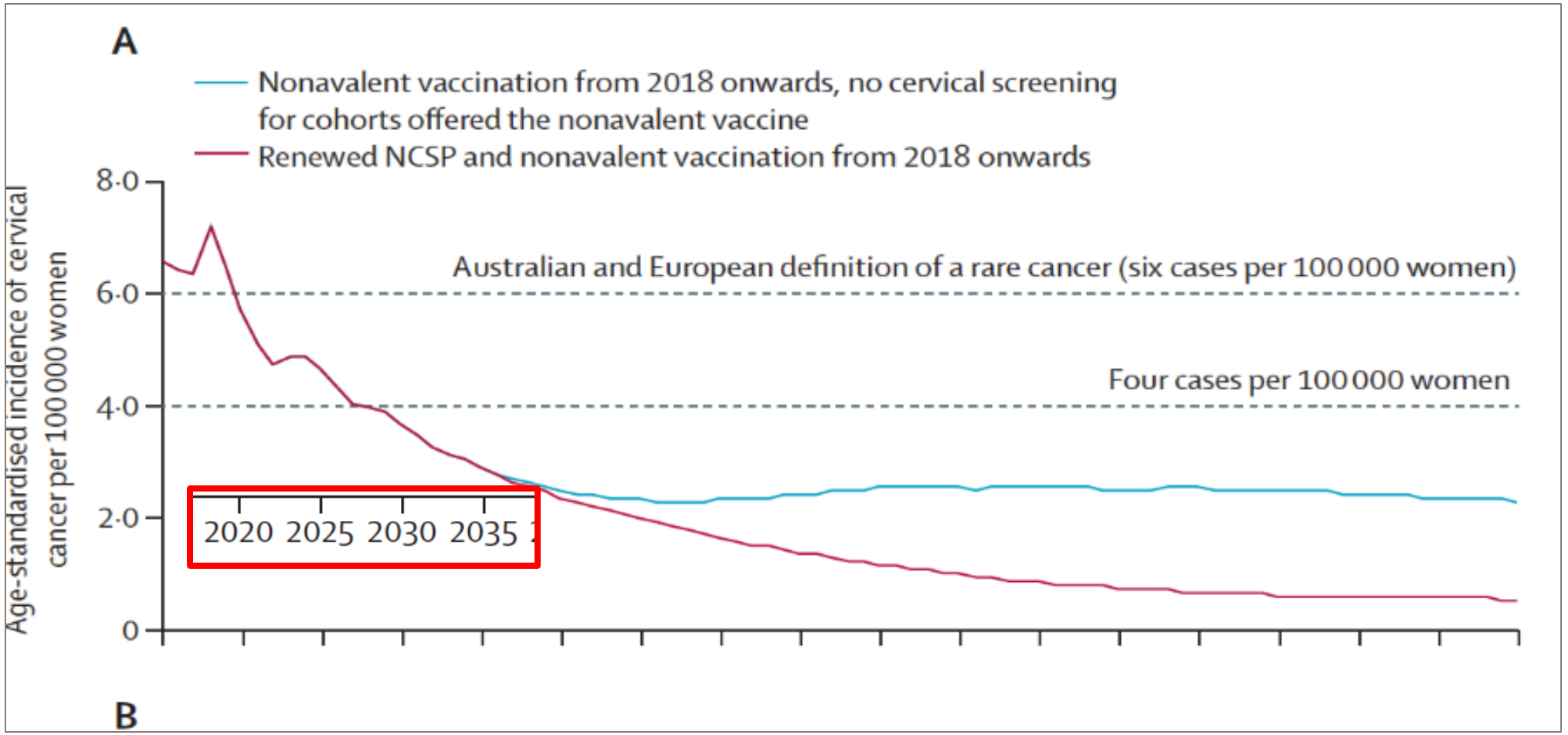
- 596,696 women were invited.
- 49.7% of them responded to the invitation.
- 9.5% turned out to be HPV+:
  - 16% used a self test
  - 2.9% was subsequently directed to a gynaecologist
  - 32% of them were CIN2+
- Population screening participation for colorectal cancer (2020): 72%
- Population screening participation for breast cancer (2020): 70%

Source: Bevolkingsonderzoek Nederland

Part 3

Elimination by combined prevention

Australia might reach cervical cancer elimination (<4 per 100.000) before 2028



Source: The Lancet Public Health, 2019

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The WHO calls for elimination

"High-income countries have shown the way. In many of these countries, cervical cancer is becoming a thing of the past. Now is the time for global elimination."

Tedros Adhanom Ghebreyesus,
WHO Director-General,
Geneva, May 2019

WHO targets for 2030

- **90%** of girls fully vaccinated by 15 years of age
- **70%** of women are screened at age 35 and 45
- **90%** of women identified with cervical disease receive treatment and care

Source: WHO

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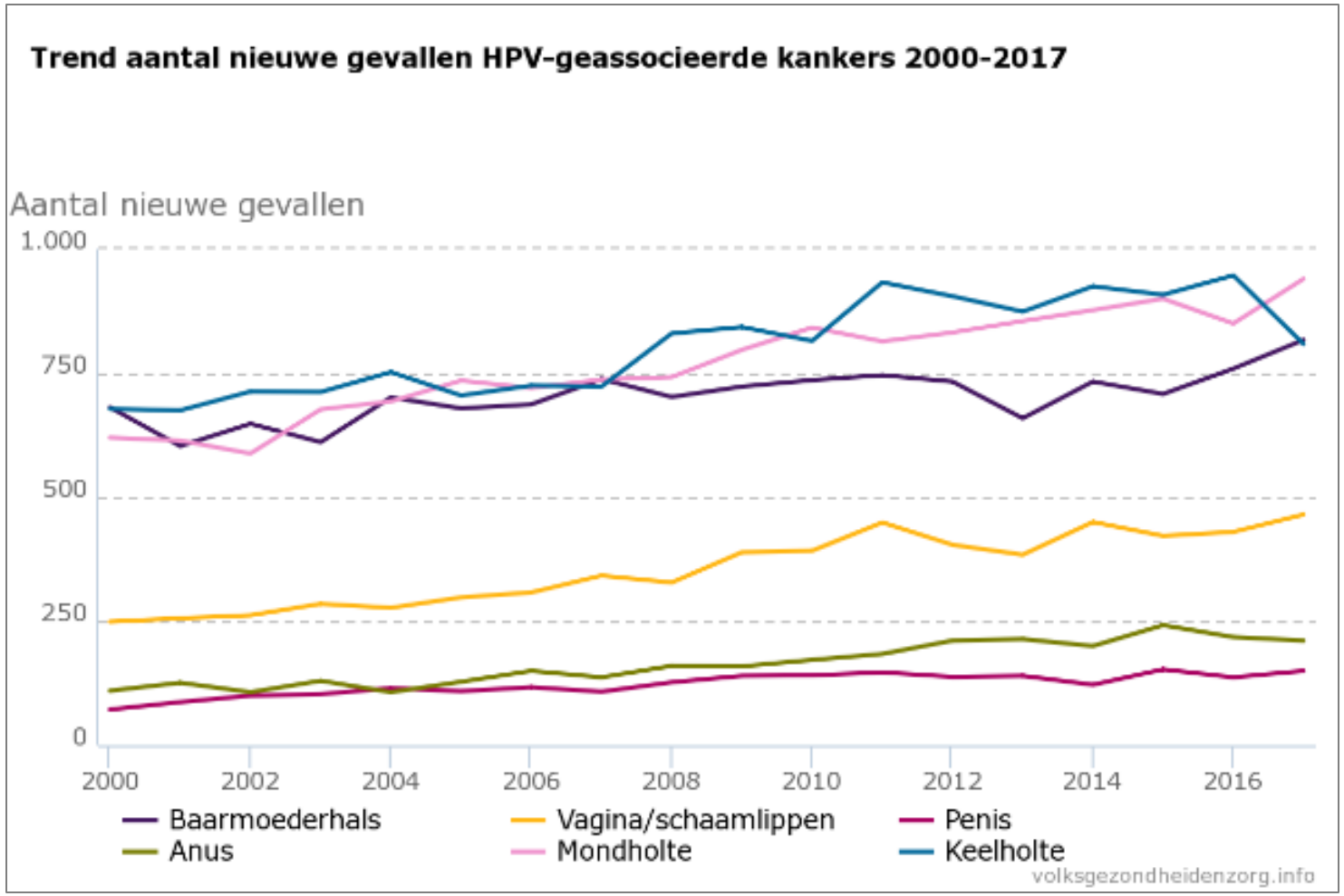
HPV vaccination might prevent 500 fatalities each year in The Netherlands



When is cervical cancer eliminated in The Netherlands?

- Embargo (Erik Janssen, MGZ Erasmus MC).
- When vaccination coverage for girls remains >55% and half of that for boys.
- If population screening participation remains 61% or more.
- Only then cervical cancer is a rare disease (incidence <4 per 100.000) in 2042.
- Australia might reach that target already in 2027.

Elimination in The Netherlands is challenging and requires national campaigns

- Inclusive message: it involves everyone.
- Boys and girls.
- All cultural backgrounds.
- Separated from cervical cancer only.
- Safe and effective against cervical cancer and probably effective against 6 types of cancer.

Vaccine hesitation: results from a US study

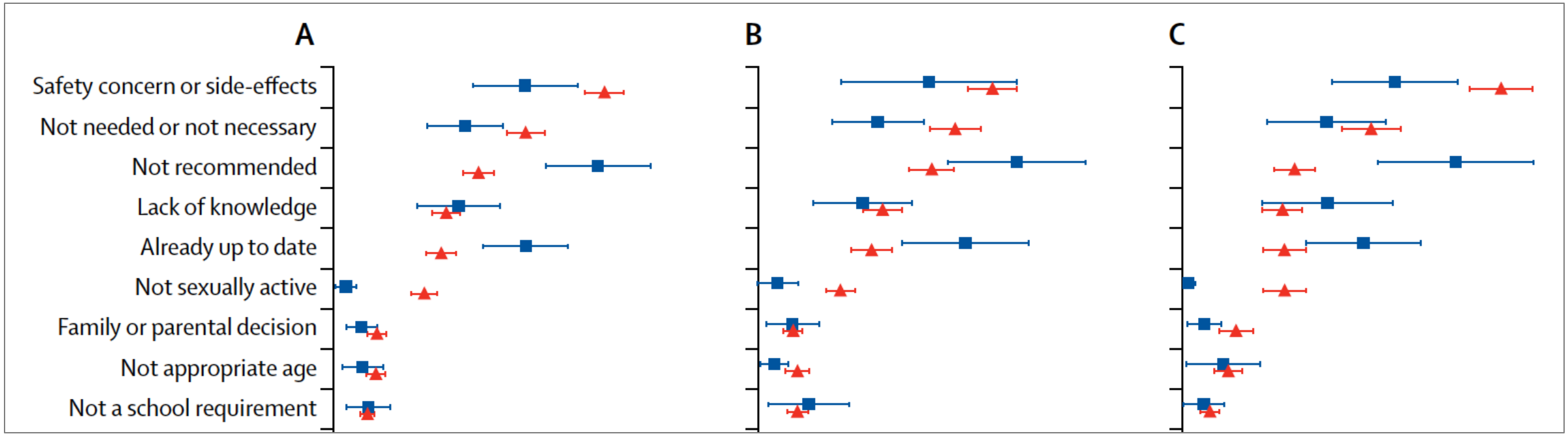


Figure 3: **Parental reasons for lack of intent to vaccinate by HPV vaccination status of the adolescent**

Data are from the National Immunization Survey-Teen 2017–18. The 28 reasons for lack of intent included in the survey and the proportion of parents who responded yes for each listed reason are illustrated. Unvaccinated adolescents received zero doses of the HPV vaccine series, initiators received only one dose of the HPV vaccine series. Parents were asked to identify the main reason; therefore, responses are mutually exclusive. (A) The most common reasons for parents of the overall adolescent population. (B) The most common reasons for parents of boys. (C) The most common reasons for parents of girls. Error bars represent the 99·8% CIs. HPV=human papillomavirus. *Those who answered "college shot" believe the vaccination is needed when the adolescent enters university (ie, at age 18 years).

Vaccine doubt: infodemic

- Countries like Denmark, Ireland, Japan, Austria, China, Colombia, Brazil, and Niger have seen waves of vaccine doubt, with collapsing vaccination programs as a result.
- This might happen any time due to social media or classical television:

In Denmark HPV vaccination took a dive after a 2014 TV broadcast about side effects.

The Danish government countered with the campaign ‘Stop HPV, Stop Cervical Cancer’.

Part 4

Establishing Taskforce HPV-kankervrij.nl in The Netherlands

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Taskforce HPV-kankervrij.nl: mission and vision

Mission:

- The Taskforce HPV-kankervrij.nl aims to eliminate HPV-associated (pre)malignancies.

Vision:

- Eliminating cervical cancer: in 2035, it should be a rare disease (incidence <4 per 100.000).

Taskforce HPV-kankervrij.nl: three goals

1. Stimulating HPV vaccination in girls and boys from age 10. The goal is to reach 90% vaccination coverage in 2025.
2. Stimulating HPV vaccination in men and women over the age treshold for vaccination invitation (10-26), to reach 70% vaccination coverage in 2030 (= catch-up campaign and vaccination AYAs).
3. Stimulating participation of population screening to reach 90% in 2025 (as defined by the WHO).

Taskforce HPV-kankervrij.nl: founders

Heleen van Beekhuizen, MD PhD
gynecologic oncologist
Erasmus MC Rotterdam
board member IGCS

Prof. Folkert van Kemenade, MD PhD
pathologist
Erasmus MC Rotterdam
member program committee
population screening cervical cancer

Taskforce HPV-kankervrij.nl: partners

nfk
Nederlandse Federatie van Kankerpatiënten organisaties

Erasmus MC Foundation
Erasmus

Elijf
Netwerk voor vrouwen met gynaecologische kanker

SOAIDS Nederland

lygature
pioneering medicine. together.

KWF

AJN
JEUGDARTSEN NEDERLAND

Role of the general practice doctor

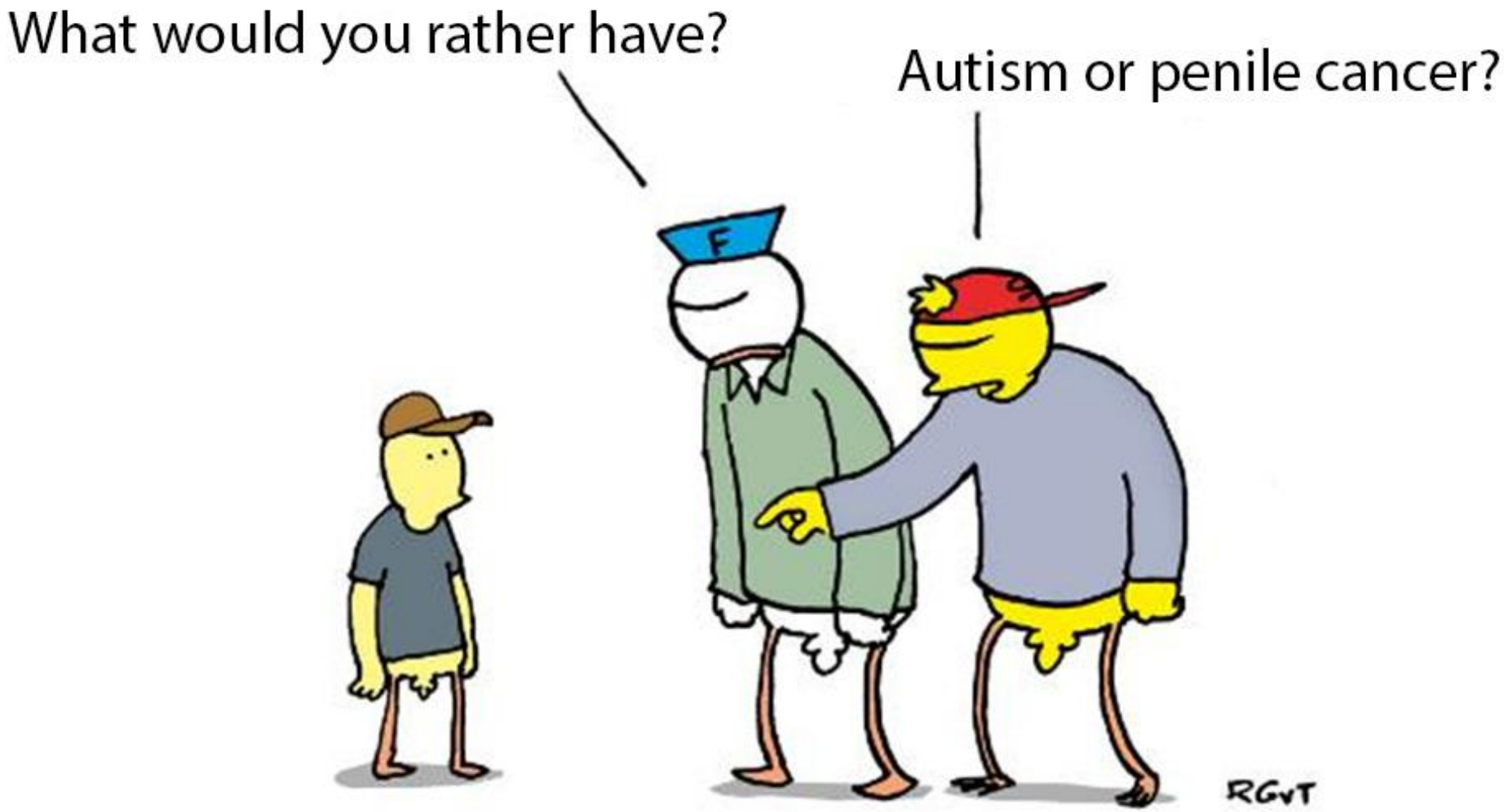
- Educate on vaccination and screening.
- Responsible for pap smear for population screening.
- Responsible for redirecting to specialist doctor.
- Proactively stimulate vaccination, for example during a conversation about birth control.
- Proactively engage parents in vaccination discussion.
- Proactively ask women age >30 whether they participate in the population screening.
- Special attention to subgroups with historically low responsiveness.

We are not alone…

Viral Protection: Achieving the Possible. A Four Step Plan for Eliminating HPV Cancers in Europe.

[…] decisive action to create an HPV-cancer-free future for men and women across Europe.

FOKKE & SUKKE
let their children co-decide about HPV vaccination



What about the countries of origin of migrants and refugees?

	incidence per 100.000	vaccination all doses at age 15	screening last 5 years
The Netherlands	9	52%	74%
Ukraine	20	no program	57%
UK	11	81%	79%
South-Africa	36	61%	43%
Romania	34	no data	42%
Poland	20	no data	87%

Source: WHO

Communication campaign

Erwin Boutsma, PhD

Program Communications Manager

Alexander Duyndam, PhD

Director Communications & External Affairs

lygature

pioneering medicine.
together.

Interested in following us or becoming a Taskforce member?

info@hpvkankervrij.nl (*also for the newsletter!*)

www.hpvkankervrij.nl

linkedin.com/company/hpv-kankervrij

twitter.com/hpvkankervrij

Questions about HPV or vaccination? Call the Twijfeltelefoon (‘*doubt phone*’)!

- 0031 88 7555777
- From 8.30 AM until 1.00 PM.
- In Turkish on Wednesdays, in Arabic on Thursdays.
- Medical students, trained by us.
- The Twijfeltelefoon is a prevention platform to share neutral and impartial medical information. It aligns with the Erasmus MC Rotterdam mission to contribute to prevention, and to diminish differences in health and health care access.

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Dank voor uw aandacht!

info@hpvkankervrij.nl

Heleen van Beekhuizen
Folkert van Kemenade