

## Webinar GISCi in collaborazione con SICPCV

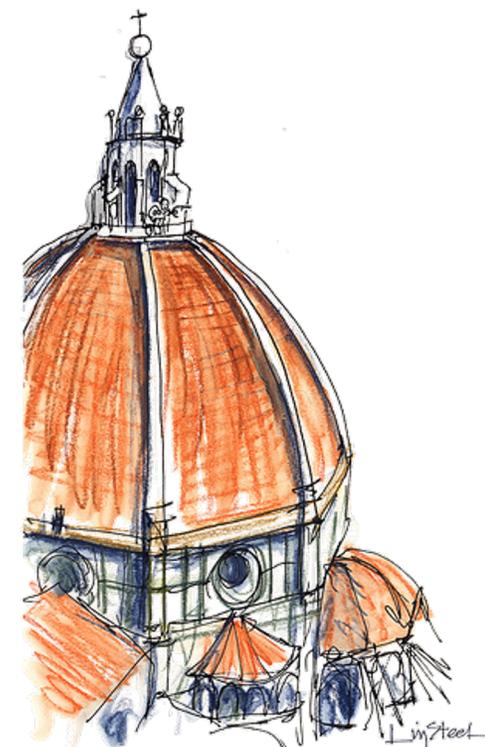
Presentazione della seconda edizione del  
“Manuale di secondo livello per lo screening del carcinoma della cervice uterina”



Come influisce la vaccinazione anti-HPV sul secondo livello?

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# Vaccinazione anti-HPV

## Quali possibili impatti sul secondo livello??



- Prevenzione primaria
- Prevenzione secondaria

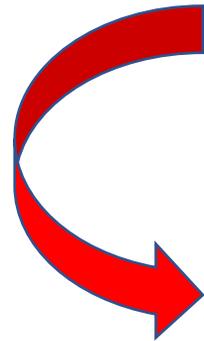
# Vaccinazione anti-HPV

## Quali possibili impatti sul secondo livello??



Prevenzione primaria

- donne vaccinate meno lesioni
- spostamento intervallo



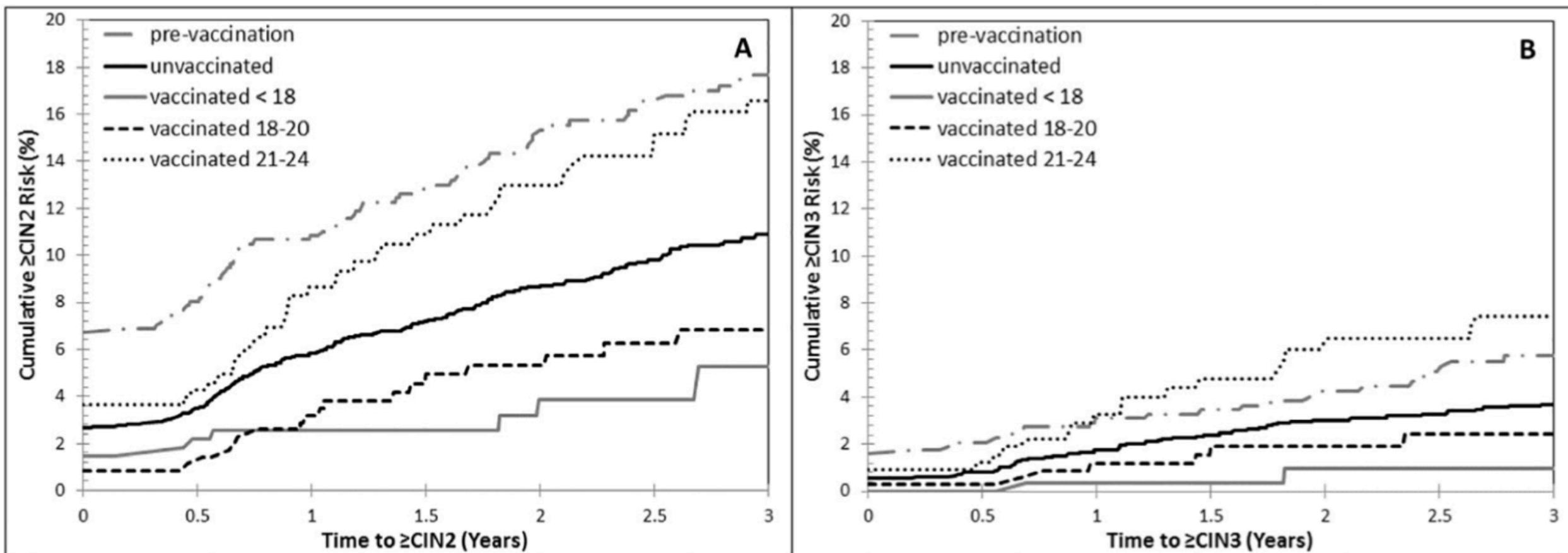
– riduzione carico del secondo livello

# Impact of human papillomavirus vaccination on the clinical meaning of cervical screening results

Philip E. Castle<sup>a,\*</sup>, Xianhong Xie<sup>a</sup>, Xiaonan Xue<sup>a</sup>, Nancy E. Poitras<sup>b</sup>, Thomas S. Lorey<sup>b</sup>, Walter K. Kinney<sup>b</sup>, Nicolas Wentzensen<sup>c</sup>, Howard D. Strickler<sup>a</sup>, Emily A. Burger<sup>d</sup>, Mark Schiffman<sup>c</sup>

Preventive Medicine 118 (2019) 44–50

N=75,008



# Eventi significativi per la vaccinazione anti-HPV in Australia



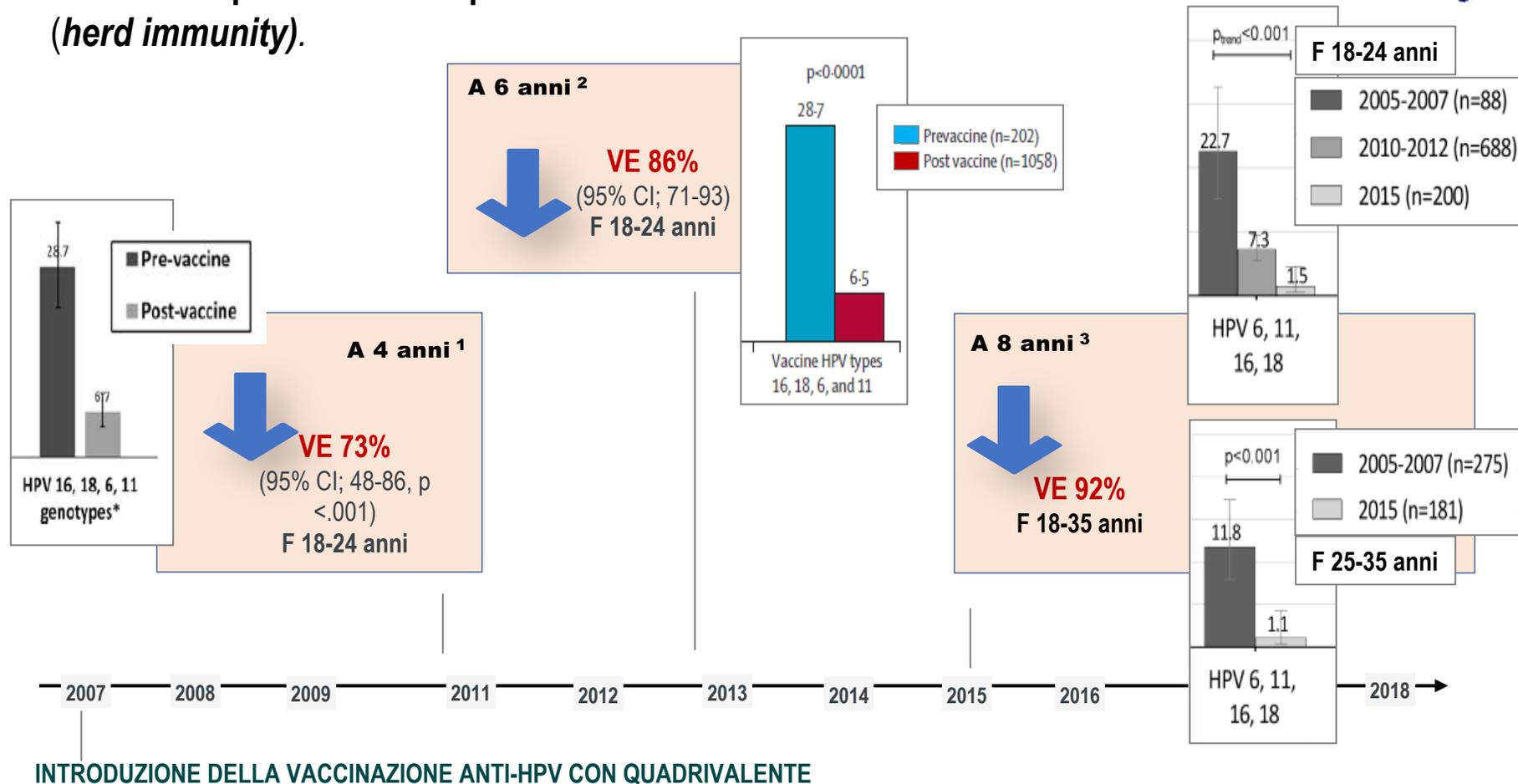
ANN O	MESE	EVENTO
2007	Aprile	Schedula a 3 dosi raccomandata per femmine di età 12–26 anni.
	Aprile	4vHPV con schedula a 3 dosi offerto a femmine di età 12–13 anni, con un programma <b>school-based</b> .
	Luglio	Catch-up temporaneo con schedula a 3 dosi di 4vHPV per femmine di età 14-26 anni con un programma <b>school-based</b> o attraverso le cure primarie.
2009	Dicembre	Termine del catch-up per femmine di età 14-26 anni.
2011	Dicembre	4vHPV con schedula a 3 dosi raccomandato per maschi di età 12–13 anni.
2013	Febbraio	4vHPV offerto a maschi di età 12–13 anni con un programma <b>school-based</b> , e catch-up per maschi di età 14–15 anni nel 2013 e 2014.
	Marzo	4vHPV con schedula a 3 dosi raccomandato per MSM (men who have sex with men, uomini che fanno sesso con uomini) e immunocompromessi.
	Marzo	Termine della raccomandazione di 4vHPV per femmine di età 19–26 anni
2018	Gennaio	9vHPV offerto agli adolescenti (con schedula a 2 dosi, programma <b>school-based</b> ) con catch-up fino a 19 anni (attraverso le cure primarie)

VC (programma *school-based*) 80% circa per 1 dose, 70% per 3 dosi in ragazze 12-17 anni.

# Infezioni da HPV 6, 11, 16, 18



- Sostanziale diminuzione dei genotipi vaccinali di HPV nelle donne vaccinate
- Prevalenza più bassa dei tipi vaccinali di HPV nelle donne non vaccinate (*herd immunity*).



VE, Vaccine Effectiveness.

1. Tabrizi SN, et al. J Infect Dis 2012. 2. Tabrizi SN, et al. Lancet Infect Dis 2014. 3. Machalek DA, et al. J Infect Dis. 2018.

# Atipie cervicali (lesioni di alto grado)



## □ Significativa diminuzione del riscontro di atipie cervicali

### A 4 anni <sup>1</sup>



#### Nelle donne vaccinate:

- IR HG<sup>§</sup> 4,8 per 1.000 anni persona (vs 6,4 in donne non vaccinate); HR\* 0,72 (95% CI 0,58 – 0,91)
- IR HGC<sup>^</sup> 11,9 per 1.000 anni persona (vs 15,3 in donne non vaccinate); HR\* 0,75 (95% CI 0,65 – 0,87).

### A 7-8 anni <sup>4</sup>



62% in F < 20 anni

— 2007 — 2008 — 2009 — 2011 — 2012 — 2013 — 2014 — 2015 — 2016 — 2017 — 2018 →

## INTRODUZIONE DELLA VACCINAZIONE ANTI-HPV CON QUADRIVALENTE

### A 4-5 anni <sup>1, 2</sup>



46-47% in F < 17 anni nel 2007

### A 6 anni <sup>3</sup>



54% in F < 20 anni (da 10,9 per 1.000 a 5; p < 0.0001)

37% in F 20-24 anni (da 21,5 per 1.000 a 13,5; p < 0.0001)

IR, Incidence Ratio. § HG, atipie istologiche cervicali di alto grado. ^ HGC, atipie citologiche cervicali di alto grado. \* HR, Hazard Ratio.

# The impact of 10 years of human papillomavirus (HPV) vaccination in Australia: what additional disease burden will a nonavalent vaccine prevent?

TABLE  
Burden

Cancer

Cyra Patel<sup>1</sup>, Julia ML Brotherton<sup>2,3</sup>, Alexis Pillsbury<sup>1</sup>, Sanjay Jayasinghe<sup>1,4</sup>, Basil Donovan<sup>5,6</sup>, Kristine Macartney<sup>1,4</sup>, Helen Marshall<sup>7,8</sup>

Additional  
burden with  
vaccine

Cervical (F) <sup>a</sup>	7.4 [25]	1.7 [25]	869 [25]	224 [25]	100% [73]	869	72% [40]	624	15% [40]	129
Anal (F) <sup>a</sup>	1.8 [4]	0.3 [4]	232 [4]	39 [4]	90.8% [73]	211	93% [8]	196	11% [44]	23
Anal (M) <sup>a</sup>	1.4 [4]	0.3 [4]	166 [4]	33 [4]	74.9% [73]	124		116	4% [44]	5
Penile (M) <sup>b</sup>	0.7 [8]	NA	82 [74]	17 [74]	50% [8]	41	87% [8]	36	9% [44]	4
Vulval (F) <sup>c</sup>	2.3 [75]	NA	311 [74]	68 [74]	40% [8]	124	86% [8]	107	14% [44]	17
Vaginal (F) <sup>c</sup>	0.6 [75]	NA	69 [74]	21 [74]	70% [8]	48	88% [8]	43	18% [44]	9
Oral (F) <sup>d</sup>	NA	NA	24 [73]	NA	6.8% [73]	2	95% [8]	2	NA	NA
Oral (M) <sup>d</sup>	NA		53 [73]			4		3		
Oropharyngeal (F)	1.0 [11] <sup>e</sup>	0.6 [74] <sup>f</sup>	67 [73] <sup>g</sup>	147 [74] <sup>f</sup>	39.8% [73]	27	95% [8]	25	NA	NA
Oropharyngeal (M)	4.0 [11] <sup>e</sup>		237 [73] <sup>g</sup>			94		90		
All HPV-associated cancers	NA	NA	2,110	402	NA	1,544	NA	1,242	NA	187

9v-non4vHPV types: HPV 31, 33, 45, 52, 58; F: females only; HPV: human papillomavirus; M: males only; NA: data not available.

The estimates of the number of preventable cases were calculated using published statistics (as cited in the table) in the following formulae:

Number of cases due to HPV = number of cases per year × % of cases due to HPV.

Number of cases prevented by 4vHPV = number of cases due to HPV × % of HPV-associated cases due to HPV 16 or 18.

Number of additional cases preventable by 9vHPV = number of cases due to HPV × % of HPV-associated cases due to 9v-non4vHPV types.

<sup>a</sup> Incidence rates and cases from 2012 and mortality rates and cases from 2013.

<sup>b</sup> Incidence rate from 2005 (reported in [8]), incidence cases from 2009 and mortality cases from 2010.

<sup>c</sup> Incidence rates from 2008, incidence cases from 2009 and mortality cases from 2010.

<sup>d</sup> Includes ICD codes Co2-Co4. Incidence cases from 2010.

<sup>e</sup> Includes ICD codes Co1, Co5, Co9, C10 and/or C14. Incidence rates from 2008 (reported in [11]).

<sup>f</sup> Combined for males and females and includes ICD codes Co9 and/or C10 only. Mortality rates and cases from 2010.

<sup>g</sup> Includes ICD codes Co1, Co5, Co9 and/or C10. Incidence numbers from 2010.

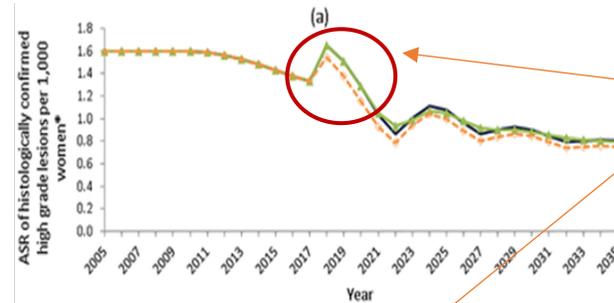
# The impact of 10 years of human papillomavirus (HPV) vaccination in Australia: what additional disease burden will a nonavalent vaccine prevent?

Cyra Patel<sup>1</sup>, Julia ML Brotherton<sup>2,3</sup>, Alexis Pillsbury<sup>1</sup>, Sanjay Jayasinghe<sup>1,4</sup>, Basil Donovan<sup>5,6</sup>, Kristine Macartney<sup>1,4</sup>, Helen Marshall<sup>7,8</sup>

...replacement of 4vHPV vaccine with 9vHPV vaccine in the Australian vaccination programme can potentially prevent an additional 15% of cervical cancers and 11% of anal cancers

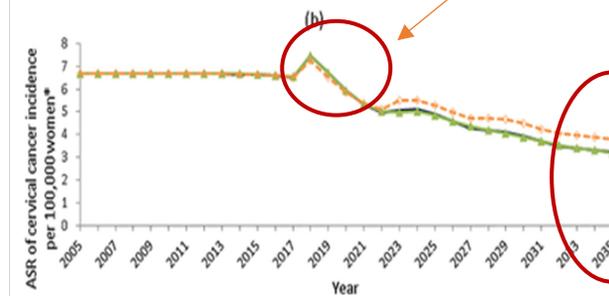
# Predicted short term impact of vaccination and HPV screening

CIN2/3



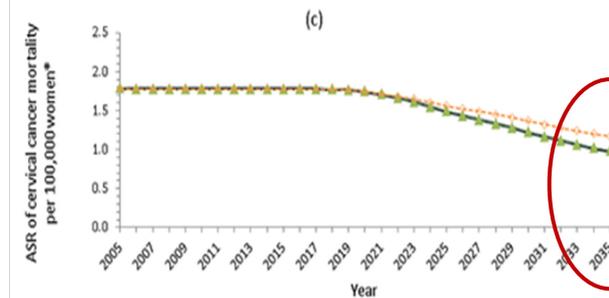
Transitional increase in rates

Invasive cervical cancer



50% reduction

Cervical cancer death

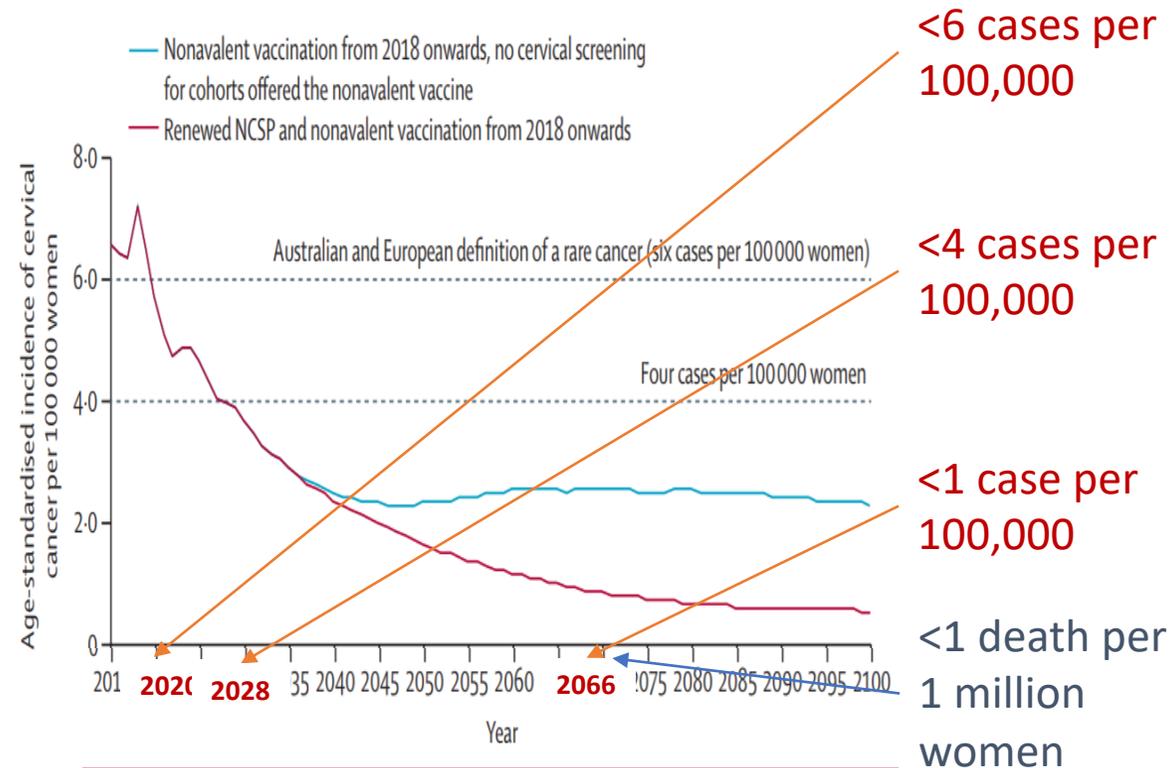


45% reduction

— Baseline analysis (base case scenario)  
- - Sensitivity analysis (base case scenario)- Screening coverage lower bound  
... Sensitivity analysis (base case scenario)- HPV test sensitivity lower bound

# Predicted long term impact of vaccination and HPV screening

Projected age-standardised annual incidence of invasive cervical cancer



# Impact of HPV vaccination and cervical screening on cervical cancer elimination: a comparative modelling analysis in 78 low-income and lower-middle-income countries

*Marc Brisson\*, Jane J Kim\*, Karen Canfell\*, Mélanie Drolet, Guillaume Gingras, Emily A Burger, Dave Martin, Kate T Simms, Élodie Bénard, Marie-Claude Boily, Stephen Sy, Catherine Regan, Adam Keane, Michael Caruana, Diep T N Nguyen, Megan A Smith, Jean-François Laprise, Mark Jit, Michel Alary, Freddie Bray, Elena Fidarova, Fayad Elsheikh, Paul J N Bloem, Nathalie Broutet, Raymond Hutubessy*



January 2020

- Girls were vaccinated at age 9 years (with a catch-up to age 14 years), assuming 90% coverage and 100% lifetime protection against HPV types 16, 18, 31, 33, 45, 52, and 58.
- Cervical screening involved HPV testing once or twice per lifetime at ages 35 years and 45 years, with uptake increasing from 45% (2023) to 90% (2045 onwards).

# Impact of HPV vaccination and cervical screening on cervical cancer elimination: a comparative modelling analysis in 78 low-income and lower-middle-income countries

*Marc Brisson\*, Jane J Kim\*, Karen Canfell\*, Mélanie Drolet, Guillaume Gingras, Emily A Burger, Dave Martin, Kate T Simms, Élodie Bénard, Marie-Claude Boily, Stephen Sy, Catherine Regan, Adam Keane, Michael Caruana, Diep T N Nguyen, Megan A Smith, Jean-François Laprise, Mark Jit, Michel Alary, Freddie Bray, Elena Fidarova, Fayad Elsheikh, Paul J N Bloem, Nathalie Broutet, Raymond Hutubessy*



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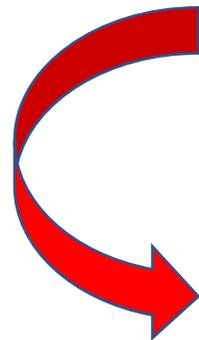
- Predictions were consistent across the three models and suggest that high HPV vaccination coverage of girls can lead to cervical cancer elimination in most LMICs by the end of the century.
- Screening with high uptake will expedite reductions and will be necessary to eliminate cervical cancer in countries with the highest burden.

# Vaccinazione anti-HPV

## Quali possibili impatti sul secondo livello??



- Prevenzione secondaria : prevenzione di lesioni future in pazienti già affette da patologia



vaccinazione post trattamento



# Burden of HPV-Related Recurrent Diseases in Females

Disease	Study Description	Burden of Recurrence	Time to Recurrence
<b>Post-LEEP Persistent HPV Infection</b>	Meta-analysis of 25 studies estimating incidence of HPV infection and subsequent disease after treatment for CIN <sup>1</sup>	<b>Up to 24%</b>	>6 to 36 months
<b>Post-LEEP High-Grade Cervical Disease</b>	Meta-analysis estimating recurrence of high-grade cervical lesions following excisional treatment for CIN 2+ <sup>2</sup>	<b>~7%</b>	Within 2 years
<b>Genital Warts</b>	Retrospective study estimating genital wart recurrence in Australian females <sup>3</sup>	<b>~30%</b> with at least 1 recurrent GW	3 years
	Retrospective chart review estimating genital wart recurrence in high-risk adults in Quebec <sup>4</sup>	<b>47%</b> with 1 recurrent GW	4 years
<b>Post-Treatment Vulvar disease</b>	Population-based case-control study of women with VIN <sup>3</sup> <sup>5</sup>	<b>~34%</b> with recurrent VIN. <b>73.4%</b> recurred within 3 years	Up to 5 years



1. Rositch AF, et al. *Gynecol Oncol.* 2014;132(3):767-779. 2. Arbyn M, et al. *The Lancet Oncology.* 2017;18(12):1665-1679. 3. Widschwendter A, et al. *Arch Gynecol Obstet.* 2019;300(3):661-668. 4. Thomas R, et al. *Sex Transm Dis.* 2017;44(11):700-706. 5. Madeleine MM et al. *J Low Genit Tract Dis* 2016;20: 257–260.

# Limitations to Estimating the Burden of Recurrent Disease

Evidence is primarily from observational or retrospective surveillance studies  
Data from randomized, controlled trials is limited

Definition of disease recurrence varies by study

Factors influencing disease recurrence: Incomplete disease removal, Persistent HPV infection in surrounding tissue or a newly acquired HPV infection

Factors influencing burden of disease: Age, HPV status, case definition, availability of HPV testing, treatment modality, and methods of follow-up for surveillance

# HPV Vaccine Effectiveness Against HPV-Related Disease Recurrence: Non-Randomized Trials in Females

Author	Non-Randomized	Study Type	Age Range 	Clinical Recurrent Disease Endpoint	Duration of Follow-up After Treatment
Ghelardi et al 2018 <sup>1</sup>	✓	Prospective	18-45 years	CIN 2+	4 years
Joura et al 2012 <sup>2</sup>	✓	Retrospective	16-26 years	CIN, VIN, VaIN, Genital Warts	3.7 years
Kampers et al 2019 <sup>3</sup>	✓	Meta-analysis	18-45 years	CIN 2+	> 3 years (median)
Kang et al 2013 <sup>4</sup>	✓	Retrospective	20-45 years	CIN 2/3	2 years
Sand et al 2019 <sup>5</sup>	✓	Prospective	17-51 years	CIN 2+	8 years
Petrillo 2020 <sup>6</sup>	✓	Retrospective	30-49 years	CIN Any grade	2 years
Del Pino et al 2020 <sup>7</sup>	✓	Prospective	Mean, 40 years	HSIL/CIN 2+	2 years



1. Ghelardi A, et al. *Gynecol Oncol*. 2018;151(2):229-234. 2 Joura EA, et al. *BMJ*. 2012;344:e1401. 3. Kampers J et al. *EUROGIN* 2019. 4. Kang WD, et al. *Gynecol Oncol*. 2013;130(2):264-268. 5. Sand FL, et al. *Int J Cancer*. 2019. 6. Petrillo M, et al. *Vaccines (Basel)*. 2020;8(1):E45. 7. Del Pino et al. *Vaccines*. 2020;8(2):E245

# Effectiveness of 4-Valent HPV Vaccine Against Recurrent Disease and Abnormal Cytology: Randomized Trial in Italy

- 178 women 23–44 years of age with previous history of treatment for HPV-related disease; 30 had been treated for **LSIL**, 148 had received conization for **HSIL**; Half received the **4-valent HPV vaccine** 3 months after treatment
- **Exclusions evaluated at 3 months after treatment** : positive HPV test, abnormal cervical cytology or HPV-related disease evident at enrollment colposcopy

### Primary Endpoint

Group	Number of Women	Recurrence	No Recurrence
Vaccinated	89	3 (3.4%)*	86 (96.6%)
Unvaccinated	89	12 (13.5%)	77 (86.5%)

\*  $p < 0.05$ ; Recurrent cases positive for HPV types 16, 31; one case positive for both HPV 18 and 33

The rate of disease recurrence was **significantly lower** in vaccinated women (3.4%) compared to unvaccinated women (13.5%),  $p < 0.05$ ; this represents a **75% decline**

# Effectiveness of 4-Valent HPV Vaccine Against Recurrent Disease and Abnormal Cytology: Randomized Trial in Italy

## Secondary Endpoint

Group	Number of Women	Pap Test Positive	Pap Test Negative
<b>Positive Cytology</b>			
Vaccinated	89	7 (8.0%)*	82 (92%)
Unvaccinated	89	23 (26%)	66 (74%)
<b>Persistent Positive Cytology</b>			
Vaccinated	89	0*	89 (100%)
Unvaccinated	89	9 (10%)	80 (90%)
* $p < 0.05$			

Women vaccinated with 4-valent HPV vaccine had **reduced rates** of positive cytology and persistent positive cytology during follow-up after treatment; ( $p < 0.05$ )

# Effectiveness of 4-Valent HPV Vaccine on Disease Recurrence After Treatment of CIN 2+: Case-Control Study in Italy

**SPERANZA:** Case-control study evaluated 4-valent HPV vaccine in the prevention of disease recurrence

- 350 women **18-45 years of age** treated for **CIN 2+**
- First vaccine dose administered **30 days after treatment**
- Cervical conization was done by LEEP technique
- Clinical recurrence defined as disease relapse of histologically confirmed  $\geq$  **CIN 2+** during the follow-up period of **4 years**

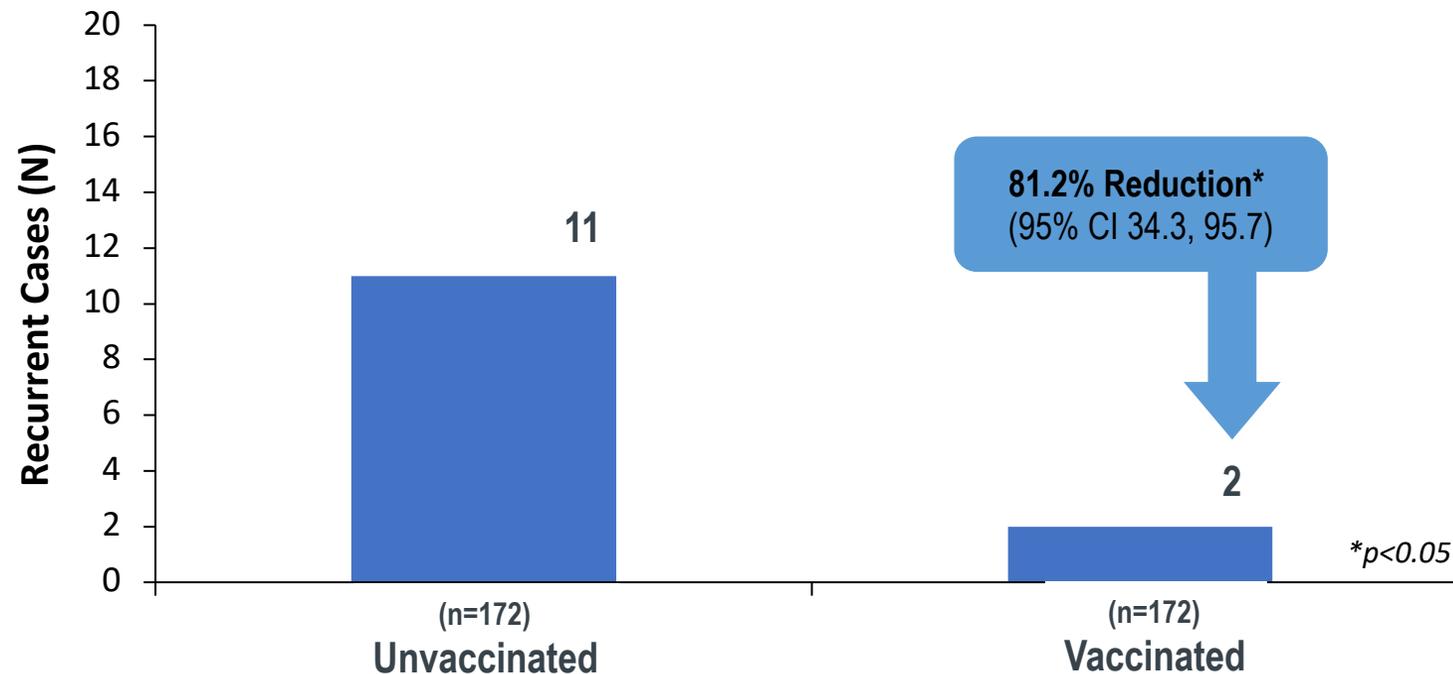
## Disease Recurrence After Treatment

	Vaccinated (n=172)	Unvaccinated (n=172)	% Risk Reduction in Recurrence Rate with Vaccine
Women with disease recurrence	2	11	<b>81.2 %</b> (95% CI: 34.3, 95.7)
Recurrence Rate	1.2%	6.4%	

CI=confidence interval; CIN 2+=cervical intraepithelial neoplasia grade 2 or worse; SPERANZA=SPERimentazione Anti HPV Zona Apuana; LEEP=Loop Electrosurgical Excision Procedure

# Effectiveness of 4-Valent HPV Vaccine on Disease Recurrence After Treatment of CIN 2+: Case-Control Study in Italy

## Impact of 4-Valent HPV Vaccine on Recurrent CIN Cases Following Conization for CIN 2+



Significant reductions in clinical disease relapse of **81.2%** occurred among women who had received the 4-valent vaccine after conization;

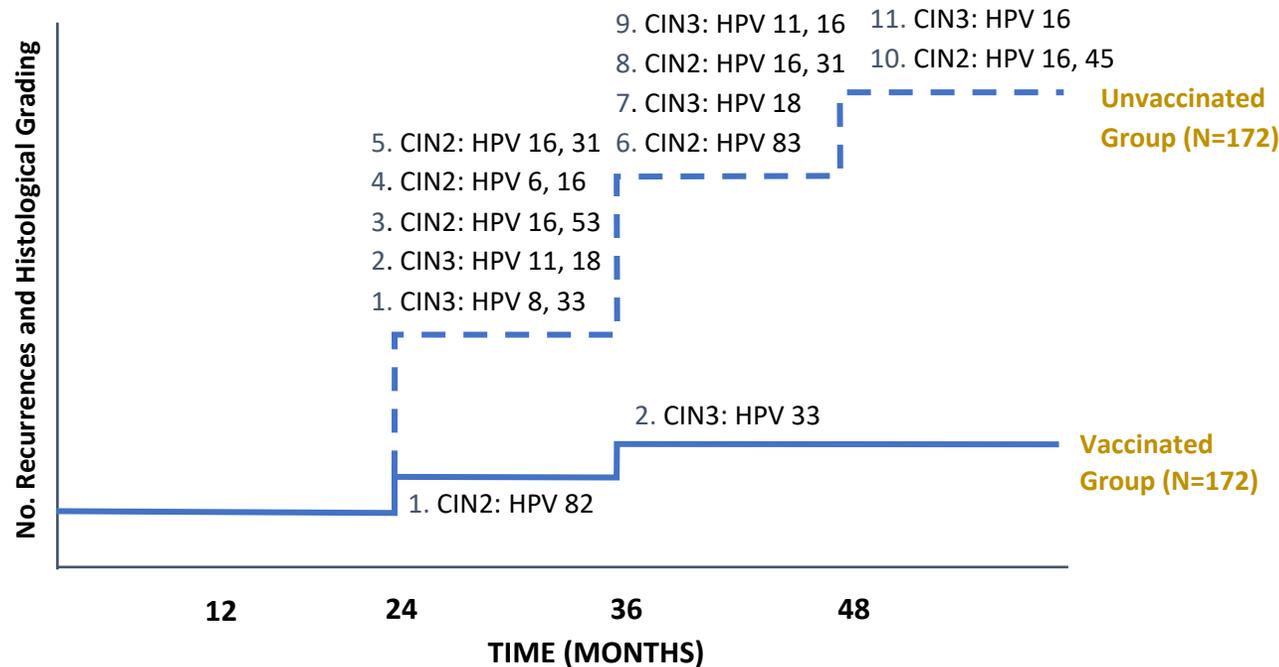
- **2 cases** of recurrence occurred in the vaccinated group
- **11 cases** of recurrence occurred in the unvaccinated group

CI=confidence interval; CIN 2+=cervical intraepithelial neoplasia grade 2 or worse; LEEP=loop electrosurgical excision

Ghelardi A, et al. SPERANZA project: HPV vaccination after treatment for CIN2. *Gynecol Oncol.* 2018;151(2):229-234.

# Effectiveness of 4-Valent HPV Vaccine on Disease Recurrence After Treatment of CIN 2+: Case-Control Study in Italy

## Grade of Recurrent Lesion and HPV Type At the Time of Recurrent Disease Treatment



## HPV Type Distribution at Disease Recurrence

HPV Type	Non-Vaccinated Group (N=172) N (%)	Vaccinated Group (N=172) N (%)
16	7 (63%)	
31	2 (18%)	
82	1 (9%)	1 (50%)
53	1 (9%)	
11	2 (18%)	
18	2 (18%)	
33	1 (9%)	1 (50%)
45	1 (9%)	

- **None of the vaccine HPV types** were detected in the recurrent disease in the vaccinated group

CIN 2+=cervical intraepithelial neoplasia grade 2 or worse

# Effectiveness of 4-valent HPV Vaccine on Incidence of New HPV Diseases After Treatment: Retrospective Analysis

## Retrospective Analysis

- 2 randomized placebo-controlled trials: **FUTURE I and FUTURE II**
- 1,350 women 16-26 years of age who received either **4-valent HPV vaccine or placebo** included in analysis
- Recurrence included any HPV-related diseases that occurred  $\geq 60$  days after cervical surgery

### Women with surgical treatment for cervical disease:

n=587 vaccine, n=763 placebo

### Women with diagnosis of genital warts, VIN, or VaIN after enrollment:

n=229 vaccine, n=475 placebo



Vaccination was associated with a **46.2%** reduction (95% CI: 22.5%, 63.2%) for any subsequent HPV-related disease,

a **48.3%** reduction (95% CI: 19.1%, 67.6%) for CIN1 or worse,

Vaccination was associated with a **64.9%** reduction (95% CI: 20.1, 86.3) for CIN2 or worse



CIN=cervical intraepithelial neoplasia; VIN=vulvar intraepithelial neoplasia; VaIN=vaginal intraepithelial neoplasia; FUTURE=Females United to Unilaterally Reduce Endo/Ectocervical Disease

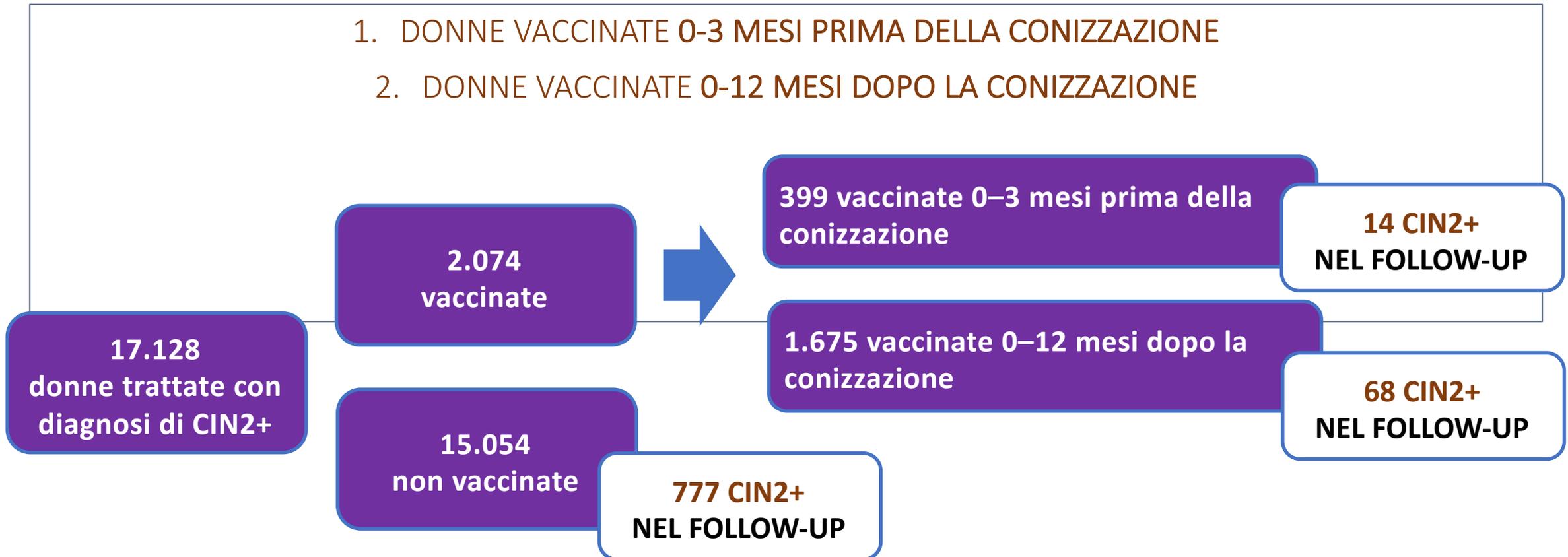
Joura EA, et al. Effect of the human papillomavirus (HPV) quadrivalent vaccine in a subgroup of women with cervical and vulvar disease: retrospective pooled analysis of trial data. *BMJ*. 2012;344:e1401.

# Effectiveness of 4-valent HPV Vaccine on Incidence of CIN2+ After Treatment: Population-Based Study in Denmark

- A prospective, population-based, cohort study assessed effectiveness of 4-valent HPV vaccine against subsequent CIN2+ after treatment; followed for 8 years

Analysis of 17,128 women with CIN3:

1. DONNE VACCINATE 0-3 MESI PRIMA DELLA CONIZZAZIONE
2. DONNE VACCINATE 0-12 MESI DOPO LA CONIZZAZIONE



# Rischio di CIN 2+ dopo conizzazione in relazione allo stato vaccinale

## *Hazard ratio per CIN2+ nelle vaccinate in relazione alla conizzazione vs non vaccinate*

Le **donne vaccinate 0-3 mesi prima** tendevano ad avere un **hazard ratio (HR) leggermente inferiore di CIN2 +** (HR aggiustato = 0,77, IC 95%: 0,45-1,32) **rispetto alle donne vaccinate 0-12 mesi dopo la conizzazione** (HR aggiustato = 0,88, IC 95%: 0,67-1,14 ), sebbene tale differenza non sia statisticamente significativa.

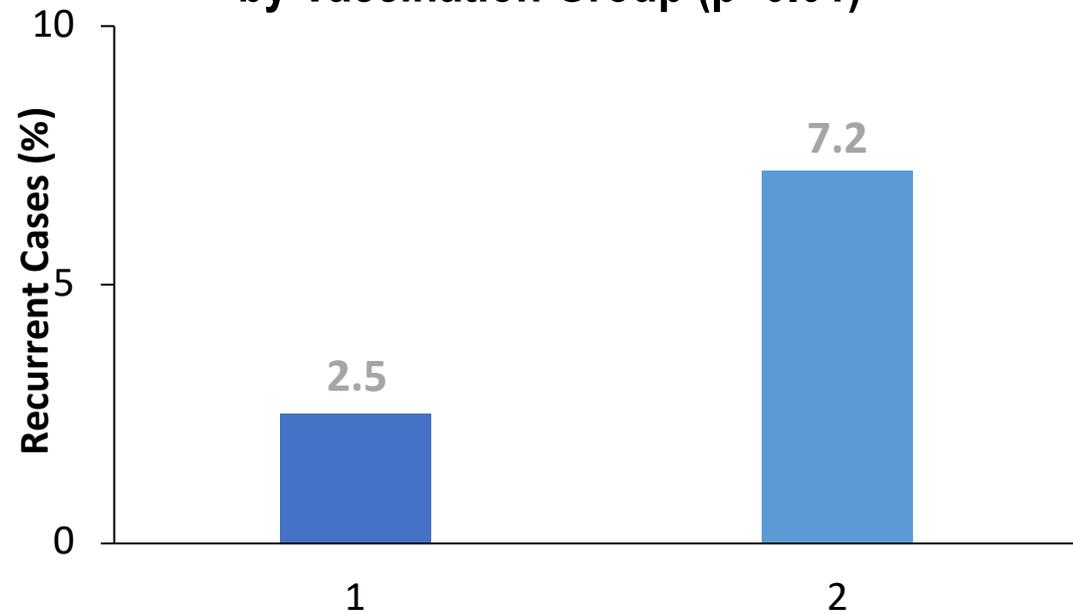
- ❑ **DONNE VACCINATE 0-3 MESI PRIMA DELLA CONIZZAZIONE HANNO UN TASSO RIDOTTO DEL 23% DI CIN2+ RISPETTO ALLE NON VACCINATE**
- ❑ **DONNE VACCINATE 0-12 MESI DOPO LA CONIZZAZIONE HANNO UN TASSO RIDOTTO DEL 12% DI CIN2+ RISPETTO ALLE NON VACCINATE**
- ❑ **EFFETTO POSITIVO DELLA VACCINAZIONE IN ENTRAMBI I SOTTOGRUPPI**

# Effectiveness of 4-Valent HPV Vaccine Following Treatment in Preventing Recurrent CIN 2/3: Prospective Study in Korea

- Prospective cohort study with 737 women 20-45 years of age with CIN2/3
- First dose of 4-valent HPV vaccine 1 week after LEEP
- 360 women vaccinated, 377 unvaccinated

- Risk of recurrent CIN2/3 irrespective of causal HPV type was significantly lower among vaccinated women ( $P < 0.01$ ):
- 2.5% in the vaccinated group (9/360).
- 7.2% in the unvaccinated group (27/377).
- Following multivariate analysis, no vaccination after LEEP was an independent risk factor for recurrent CIN2/3 (HR=2.840;  $P < 0.01$ ).

**Recurrent CIN2/3 Cases Among Women by Vaccination Group ( $p < 0.01$ )**



- CIN=cervical intraepithelial neoplasia; HR=hazard ratio; LEEP=loop electrosurgical excision procedure
- Kang WD, Choi HS, Kim SM. Is vaccination with quadrivalent HPV vaccine after loop electrosurgical excision procedure effective in preventing recurrence in patients with high-grade cervical intraepithelial neoplasia (CIN2-3)? *Gynecol Oncol.* 2013;130(2):264-268.

# Effectiveness of HPV vaccination Before and After Conization: Meta-Analysis

- Analysis included 6 prospective and retrospective studies evaluating the effect of pre- or post-conization vaccination with **4-valent or bivalent HPV vaccine**
  - Included 3,060 women; 1,427 vaccinated, 1,633 unvaccinated
  - CIN2+ was the primary endpoint in each study
- Results indicated a **reduction of risk for the development of new, high-grade CIN** after **HPV vaccination** independent of HPV type: Risk rate (RR) = 0.33 (95% CI: 0.21; 0.52)

Subgroup Analysis	RR (95% CI)
Time after Vaccination (up to 3 Years)	0.32 (0.15, 0.69)
Time after Vaccination (>3 years)	0.33 (0.19, 0.59)
HPV Vaccination Before Conization	0.31 (0.15, 0.65)
HPV Vaccination After Conization	0.34 (0.19, 0.61)

A 68% risk reduction was demonstrated for the development of high-grade CIN 3 years after HPV vaccination and surgical excision



Review

# Prophylactic HPV vaccination after conization: A systematic review and *meta-analysis*

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3 retrospective and 3 prospective studies, 3 post-hoc analyses of RCTs and one cancer registry study (n=21,059) analysing the effect of pre- or post-conization vaccination (bi- or quadrivalent vaccine) against HPV.

«overall risk reduction of developing a new or persisting CIN2 +  
after conization of 59%»

No difference in age group > or < 25 yrs

# Vaccinazione anti-HPV

## Quali possibili impatti sul secondo livello??



- Matter of time – ottime previsioni
- Implementazione della vaccinazione post-trattamento – organizzazione a livello regionale in corso
- Quadri clinici/colposcopici in cambiamento





Grazie per l'attenzione!

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