

# Preconception Care

## *A life course approach*

Ministerial Conference of Women's Health  
Rome, Oktober 3, 2014

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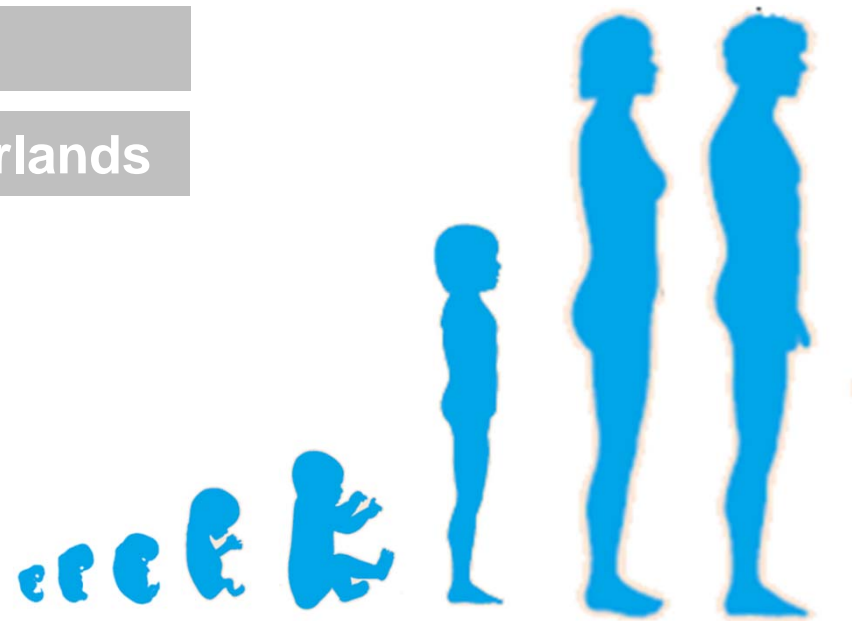
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# Contents

## Preconception care (PCC)

- Definition
- Contents and evidence
- Relevance
- Delivery approaches
- Preconception care in the Netherlands

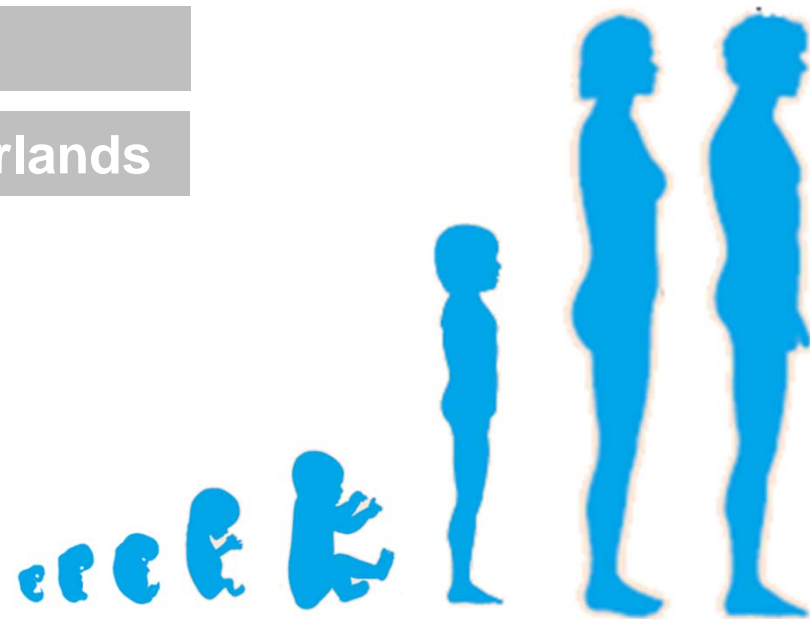


Preconception care – a lifecourse perspective  
Ministerial Conference Women's Health, Rome, 03-10-2014

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# Definition of Preconception Care

"A set of interventions and/or programmes that aims to identify and enable informed decision-making to modify biomedical, behavioural and (psycho)social risks to parental health and the health of their future child, through counselling, prevention and management, emphasizing those factors that must be acted on before conception and early pregnancy to have maximal impact and/or choice.

*\* Preconception care may be a good opportunity to reduce mortality and morbidity."*

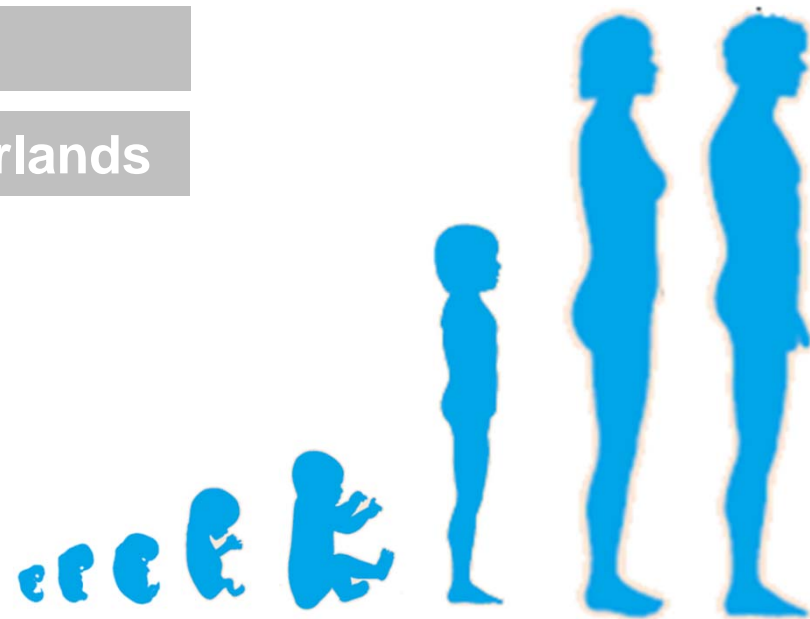


Temel et., al "The Dutch national summit on preconception care: a summary of definitions, evidence and recommendations" submitted for publication

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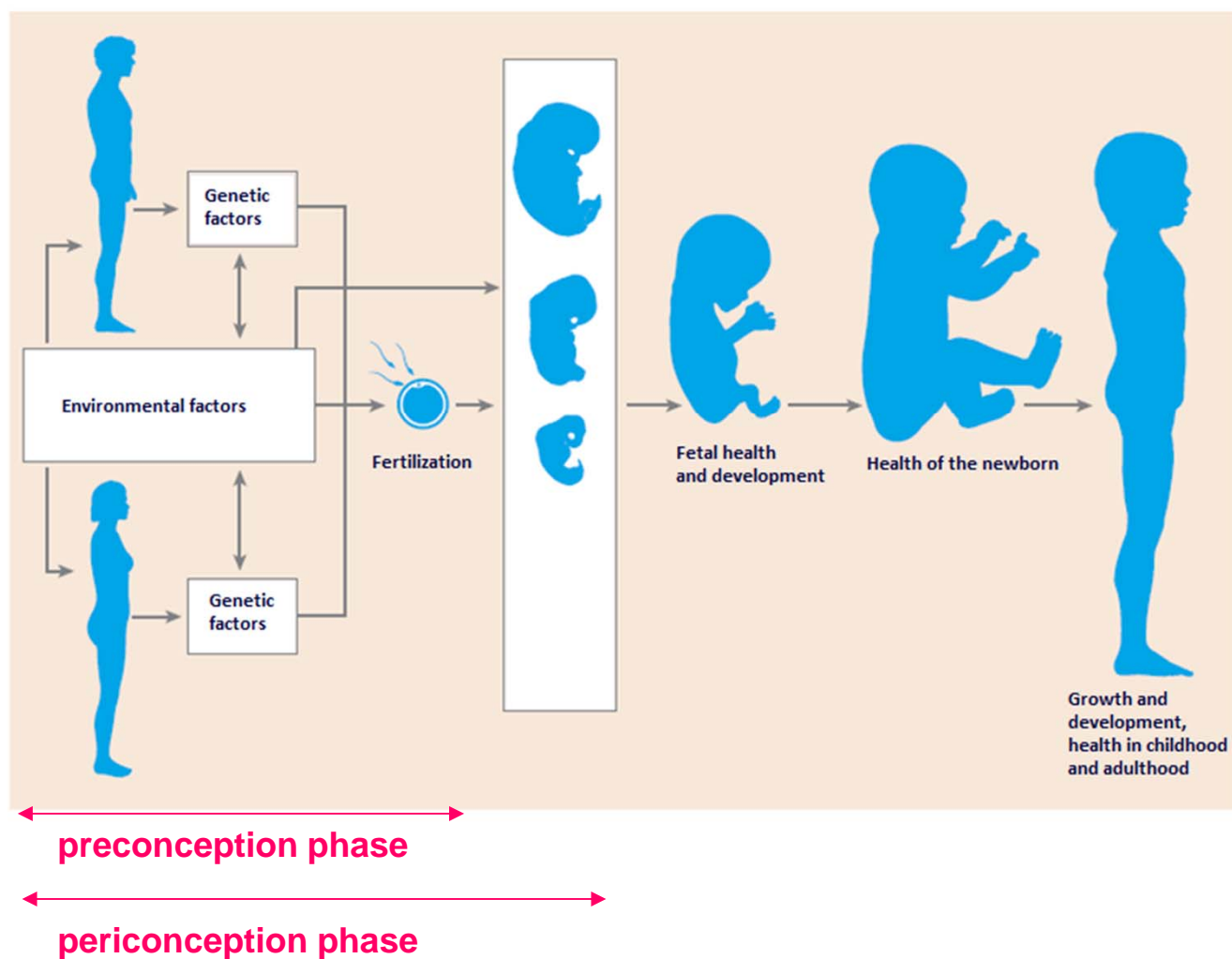
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# Contents of Preconception care

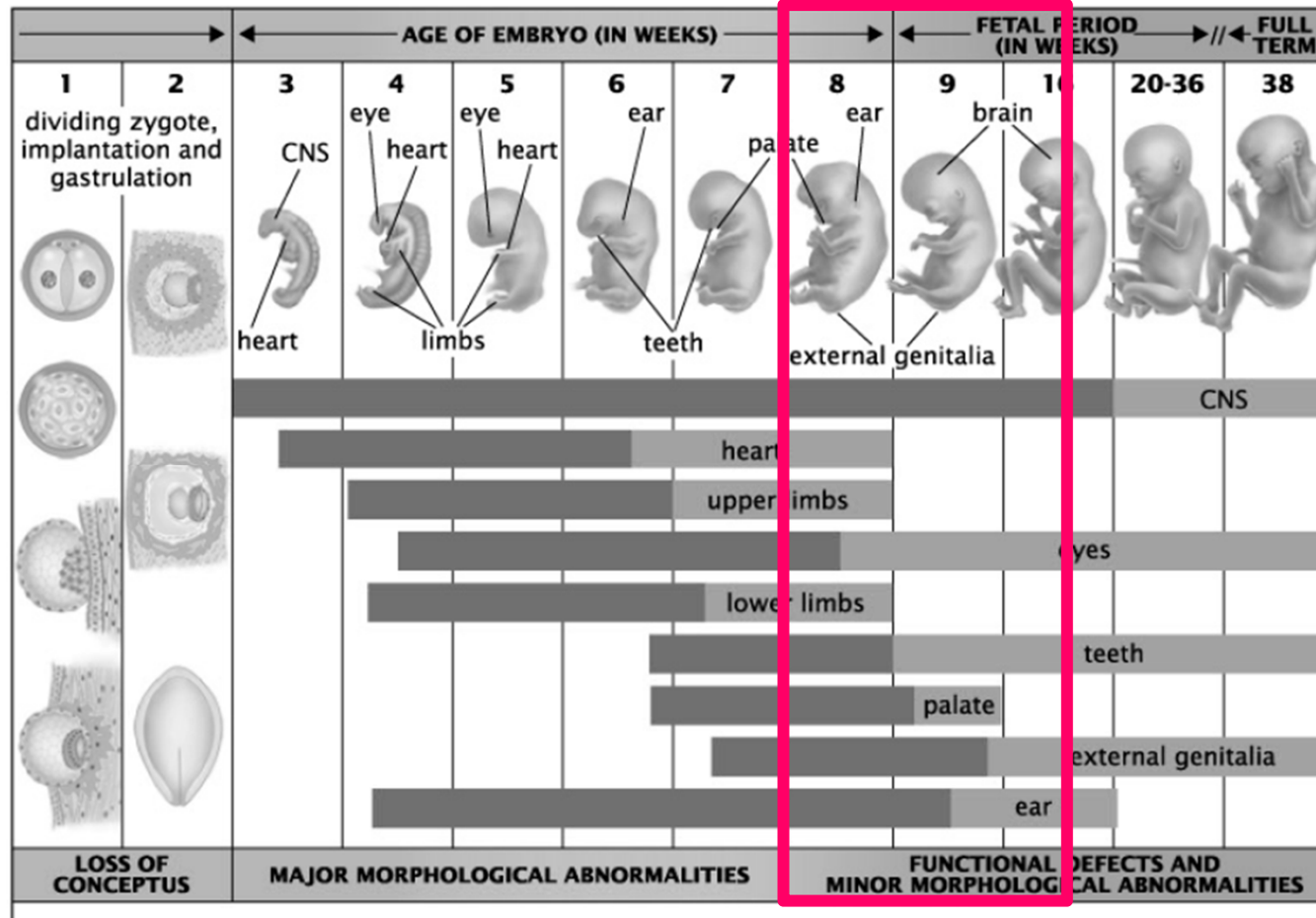
## Time phases



# Contents of Preconception care

## Time phases

## First consultation in pregnancy



- PCC is the opportunity for timely intervention before crucial events in pregnancy → addition to antenatal care!

# Contents of Preconception care

## Which risk factors should be addressed in PCC?

- Risks associated with adverse perinatal outcome(s)
- Benefit of early detection and intervention/ management in the preconception phase

## Evidence?

- 2008: Centers for Disease Control and Prevention Workgroup on Preconception Health and Disease. Meeting of selected panels

[www.AJOG.org](http://www.AJOG.org)

**The clinical content of preconception care:  
an overview and preparation of this supplement**

Brian W. Jack, MD; Hani Atrash, MD, MPH; Dean V. Coonrod, MD, MPH;  
Merry-K Moos, BSN, FNP, MPH; Julie O'Donnell, MPH; Kay Johnson, MPH, EdM

- 2012: Update:

**The Dutch national summit on preconception care: a summary of definitions, evidence and recommendations**

Sevilay Temel, Sabine F van Voorst, Lieke C de Jong- Potjer, Adja JM Waelput, Martina C Cornel,  
Sabina Rombout- de Weerd, Semiha Denктаş, Eric AP Steegers, Submitted for publication may 2014



# Contents of Preconception care

## Evidence?

### Quality of evidence

- I at least 1 properly conducted randomized controlled trial
- II well-designed controlled trials without randomization, cohort or case-control studies; multiple time series with or without intervention or dramatic results in uncontrolled experiments
- III opinions: clinical experience, descriptive statistics, case reports or reports of experts committees

# Contents of Preconception care



Risk domain	Risk factors	Evidence for risk factor			Evidence for interventions			Recommendation
		I	II	III	I	II	III	
<b>Chronic medical conditions</b>	Diabetes mellitus type 1 or 2	X			X			+
	Thyroid disease		X					+
	Phenylketonuria (PKU)		X					+
	Seizure disorders		X					+
	Hypertension		X					+
	Systemic Lupus Erythematosus (SLE)		X					+
	Chronic renal disease		X					+
	Cardiovascular disease		X					+
	Thrombophilia		X					+
	Asthma		X					+
	Rheumatoid arthritis (RA)			X				+
<b>Psychiatric conditions</b>	Depression and anxiety disorders		X					+
	Bipolar disorder		X					+
	Schizophrenia		X					+
<b>Medication</b>	Prescribed medication		X					+
	Herbs/herbal products/ weight loss products		X					+
	Over the counter drugs			X				+
<b>Genetic risks</b>	Genetic disorder(s) or carriership		X					+
	Ethnicity based risks		X					+
	Positive family history		X					+
	Known genetic conditions		X					+

# Contents of Preconception care



Risk domain	Risk factors	Evidence for risk factor			Evidence for interventions			Recommendation
		I	II	III	I	II	III	
<b>Immunizations</b>	Human Papilloma Virus (HPV)		X					-
	MMR		X			X		+
	Hepatitis B			X				-
	Varicella			X				+
	Influenza			X				-
	DTP			X				+
<b>Infection</b>	Syphilis	X						+
	HIV	X						+
	Periodontal disease	X						+
	Bacterial vaginosis	X						+
	Asymptomatic bacteriuria		X		X			+
	Herpes Simplex Virus (HSV)		X					+
	Chlamydia		X					+
	Toxoplasmosis		X					+
	GBS		X					+
	Tuberculosis		X					+
	Hepatitis C			X				+
	Cytomegalovirus (CMV)			X				+
	Parvovirus			X				+
	Malaria			X				+
	Gonorrhoea			X				+

# Contents of Preconception care



Risk domain	Risk factors	Evidence for risk factor			Evidence for interventions			Recommendation*
		I	II	III	I	II	III	
<b>Reproductive history</b>	Prior preterm birth	X						+
	Prior miscarriage	X						+
	Prior fetal growth restriction		X					+
	Prior caesarean delivery		X					+
	Prior stillbirth		X					+
	Uterine anomalies		X					+
<b>Nutrition</b>	Inadequate folate intake	X			X			+
	BMI > 30 kg/m <sup>2</sup>	X			X			+
	BMI < 18 kg/m <sup>2</sup>		X					+
	Insufficient vitamin B12		X					+
	Inadequate dietary intake		X		X			+
	Western Dietary pattern		X					+
	Excessive vitamin E intake		X					+
	Insufficient Vitamin D		X					+
	Insufficient/ excessive vitamin A			X				+
	Eating disorders			X				+
<b>Exposures</b>	Alcohol	X			X			+
	Tobacco	X						+
	Illicit substances		X					+
<b>Environmental exposures</b>	Occupational exposure		X					+
	Household exposures			X				+

# Contents of Preconception care



Risk domain	Risk factors	Evidence for risk factor			Evidence for interventions			Recommendation
		I	II	III	I	II	III	
<b>Health care promotion</b>	Interpregnancy intervals		X					+
	Lack of physical exercise		X		X			+
	Unplanned pregnancy			X				+
<b>Psychosocial stressors</b>	Inadequate financial resources		X					+
	Interpersonal violence		X					+
<b>Special groups</b>	Immigrant and refugee populations		X					
	Women who survived cancer		X					
	Women with disabilities			X				



## Evidence-Based Preconceptional Lifestyle Interventions

Sevilay Temel\*, Sabine F. van Voorst, Brian W. Jack, Semiha Denktas, and Eric A. P. Steegers

\* Correspondence to Sevilay Temel, Division of Obstetrics and Prenatal Medicine, Department of Obstetrics and Gynaecology, Erasmus University Medical Centre, Westzeedijk 118, Room WK-221, 3016 AH Rotterdam, the Netherlands (e-mail: s.temel@erasmusmc.nl).

*Accepted for publication June 17, 2013.*

Although the evidence for the associations between preconceptional risk factors and adverse pregnancy outcomes is extensive, the effectiveness of preconceptional interventions to reduce risk factors and to improve pregnancy outcomes remains partly unclear. The objective of this review is to summarize the available effectiveness of lifestyle interventions prior to pregnancy for women in terms of behavior change and pregnancy outcome. A predefined search strategy was applied in electronic databases, and citation tracking was performed. Study selection was performed by 2 independent reviewers according to predefined criteria for eligibility: The intervention was performed preconceptionally on women regarding alcohol use, smoking, weight, diet/nutrition, physical activity, and folic acid status (fortification and supplementation) to achieve behavior change and/or improve pregnancy outcome. Quality and strength of evidence were assessed by 2 independent reviewers. A total of 4,604 potentially relevant records were identified, of which 44 records met the inclusion criteria. Overall, there is a relatively short list of core interventions for which there is substantial evidence of effectiveness when applied in the preconception period.

effectiveness; health behavior; interventions; lifestyle; preconception; pregnancy outcome; prepregnancy; women

Abbreviations: CI, confidence interval; PCC, preconception care.

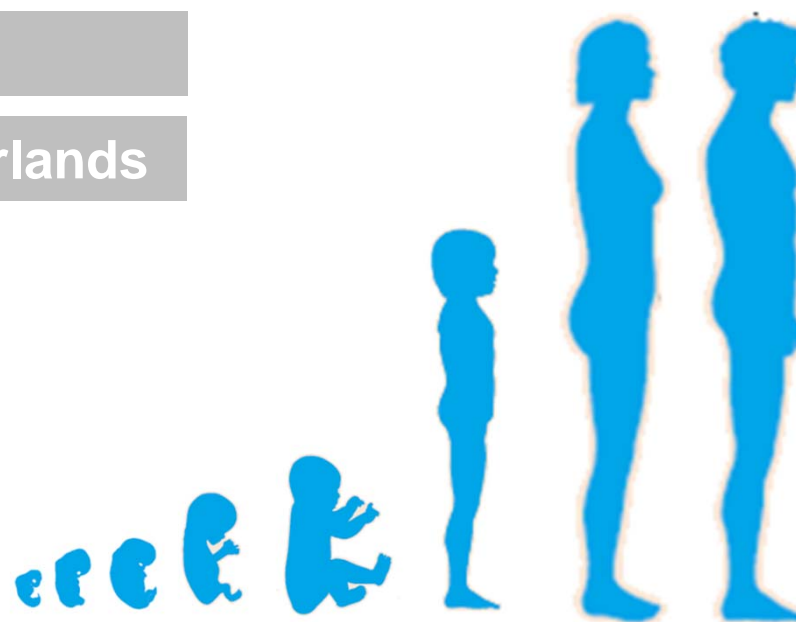
	Studies	Behavioural outcomes	Pregnancy outcomes
<b>Alcohol</b>	1	1 Reduction of alcohol exposed pregnancies <i>- Preconception population?</i>	0
<b>Smoking</b>	3	3 Decreased smoking rates, no cessation	0
<b>Folic acid (FA)</b>			
- <b>Supplementation *</b>	16	13 Increase of FA supplementation <i>- method of advice/ provision of FA often unclear</i>	5 (Neural tube effects <sup>1</sup> ) lower risk for certain congenital anomalies <b>NS</b> lower incidence of LBW <b>NS</b>
- <b>Fortification</b>	11	1 Higher FA levels	10 Postfortification reduction of Neural tube defect rates, <i>- Not all studies included stillborn and terminated pregnancies</i>
- <b>Campaigns</b>	3	1 Increase of dietary FA intake and supplementation	2 Lower risk for certain congenital anomalies <i>- Susceptible to bias</i>
<b>Nutrition</b>	3	2 Higher intake of certain micro nutrients <i>- EXCEPT for Folic acid intake</i>	1 Positive effect on birth weight <b>NS</b>
<b>Programmatic approach</b>	7	6 Positive effects on smoking cessation, alcohol reduction, FA intake <i>- Generalizability limited</i>	1 NS effect on preterm birth (<32 weeks); lowbirthweight (<2,500 g); and small for gestational age (birth weight, <10th percentile)

\*Effect of Folic acid on neural tube defects were excluded from this analysis; **NS** Not significant

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# Relevance of Preconception Care: why?

## 1. Effects on outcome of the 'index pregnancy'



Embryonic and  
perinatal health



Health in  
childhood and  
adulthood



Preconception  
health  
in later life

## 2. Effects of health promotion – when the life time event of parenthood is utilized for health promotion



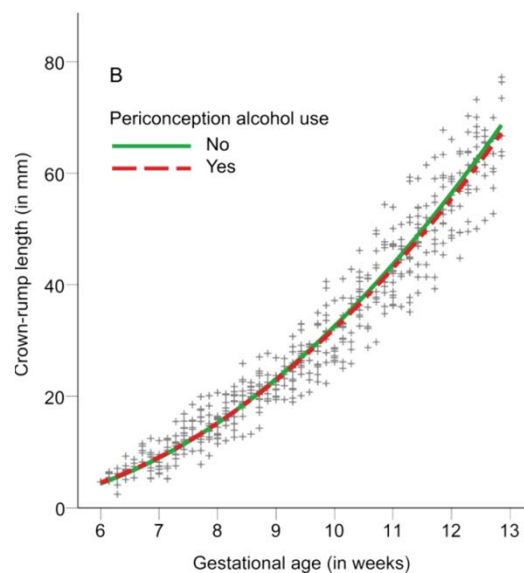
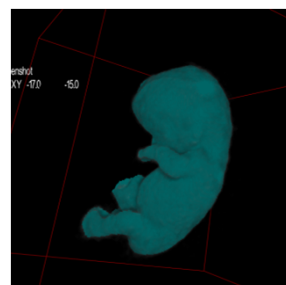
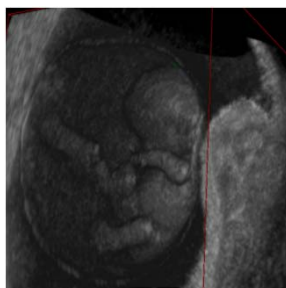
Health of  
prospective  
mothers (and  
fathers)

# Relevance of Preconception Care: why?

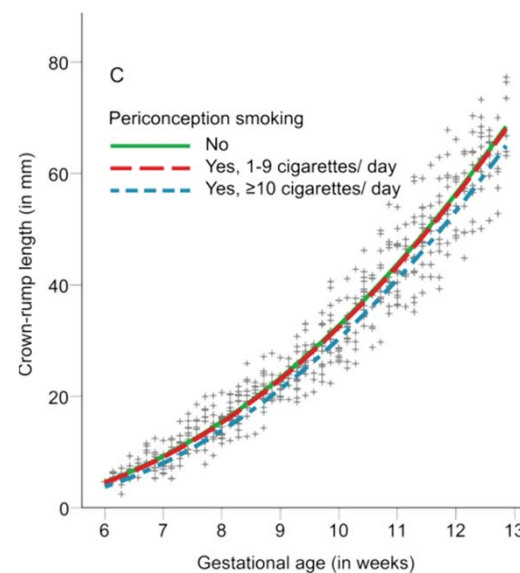


## Improvement of embryonic and perinatal health

Evidence regarding influence of risk factors on early pregnancy is growing



$$P = 0.02$$



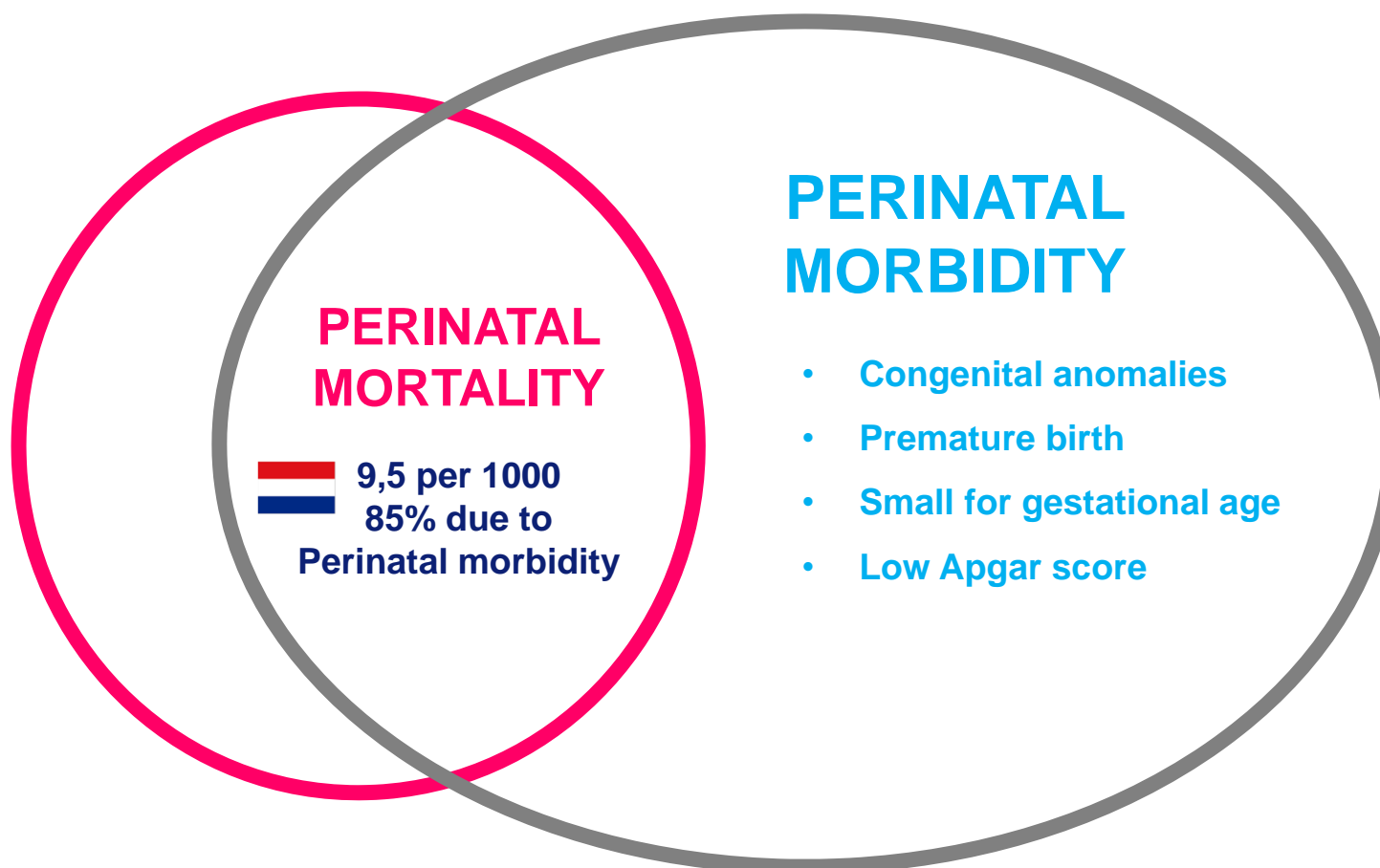
$$P_{\geq 10} = 0.04$$

# Relevance of Preconception Care: why?



Improvement of embryonic and perinatal health

Key to prevention of Perinatal Mortality



# Relevance of Preconception Care: Why?



## Improvement of health in childhood and adulthood

- Elimination of the risk to develop diseases which find their origin in the uterus

BMJ. 1995 Jul 15;311(6998):171-4.

### **Fetal origins of coronary heart disease.**

Barker DJ.

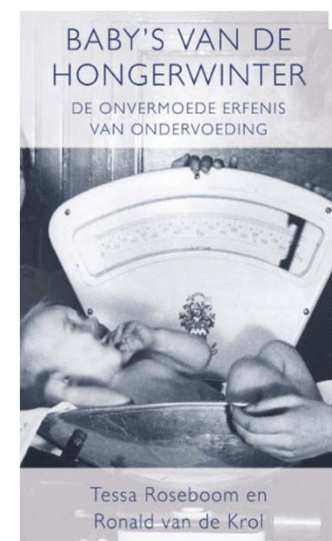
### **Growth in utero, blood pressure in childhood and adult life, and mortality from cardiovascular disease**

D J P Barker, C Osmond, J Golding, D Kuh, M E J Wadsworth

Clin Obstet Gynecol. 2006 Jun;49(2):270-83.

### **Adult consequences of fetal growth restriction.**

Barker DJ.



- PCC might promote the upbringing in a healthier environment

# Relevance of Preconception Care: why?



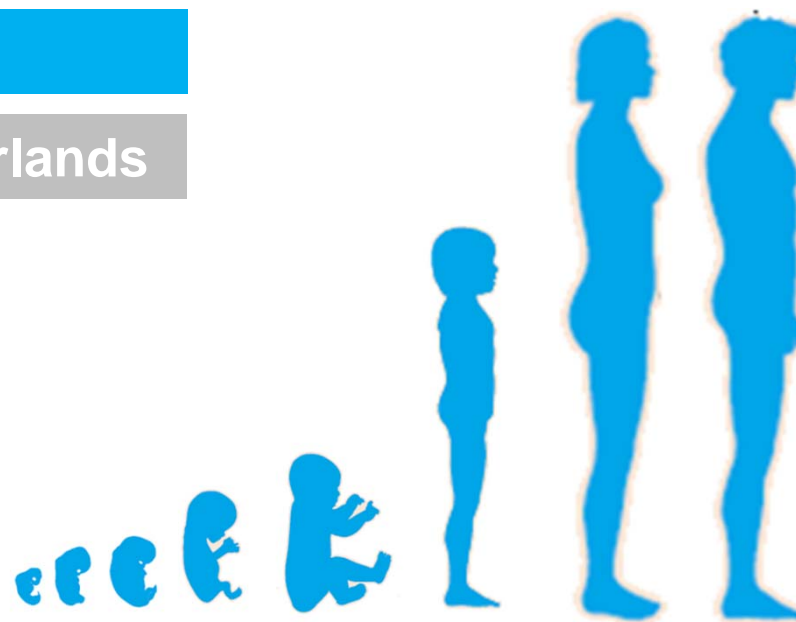
## Improvement of health of prospective mothers (and fathers)

Domain	Risk factor	Consequence of undetected/ untreated disease	
<b>Health Promotion</b>	Family planning	Teenage pregnancy, abortion	+
	Physical activity	BMI (& associated risks of obesity), mood disorders	+
<b>Psychosocial stressors</b>	Financial state	Socioeconomic related health problems	+
	Domestic violence	Physical mental sexual problems	++
<b>Lifestyle</b>	Smoking	Cardiovascular disease, different cancers, dysmenorrhoea	++
	Cannabis	Mental health problems	+
	Alcohol abuse	Liver disease, psychiatric disease, cardiovascular disease, pancreatic disease	+
	Micronutrient intake	Osteoporosis, musculoskeletal disorders, anemia, psychiatric disorders	+
	Obesity	Cardiovascular disease, Infertility, different cancers	++
<b>Infectious diseases</b>	HIV	Disease progression	+
	Hepatitis	Livercirrhosis	++
	Chlamydia, Gonorrhoea	Subfertility, PIF	+
	Syphilis	Symptomatic syphilis	+
<b>Environmental factors</b>	Environmental agents	Neurologic effects, cancerogenous effects	+

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# Delivery of Preconception care

Organisation of Preconception Care		
Individual PCC consultations	<ul style="list-style-type: none"> <li><b>General PCC:</b> For: all couples contemplating pregnancy</li> </ul>	<i>Folic acid suppletion, smoking cessation</i>
	<ul style="list-style-type: none"> <li><b>Specialistic PCC:</b> For: all couples contemplating pregnancy with: <ul style="list-style-type: none"> <li>- predefined risk factors</li> <li>- risk factors detected during general preconception care</li> </ul> </li> </ul>	<i>Maternal diabetes</i>
Collective measures	<ul style="list-style-type: none"> <li><b>Campaigns, group sessions:</b> <ul style="list-style-type: none"> <li>- Population wide</li> <li>- targeted</li> </ul> </li> </ul>	<i>Folic acid fortification</i> <i>Teenagers, women postpartum</i>
Dutch Health Council 2007		

- Combining strategies → synergistic effect?
  - Important to have consistency in health messages

# Delivery of Preconception care

## Organisation of Preconception Care

Individual PCC consultations

Risk analysis/ inventarisation

Providing information and advice

Intervention

Counselling

Challenges	Solutions
Outreach	<ul style="list-style-type: none"> <li>- Investing in pregnancy planning</li> <li>- Identifying high risk population</li> </ul>
Broad scope of risk factors	<ul style="list-style-type: none"> <li>- Using tools</li> <li>- Multidisciplinary guidelines</li> </ul>



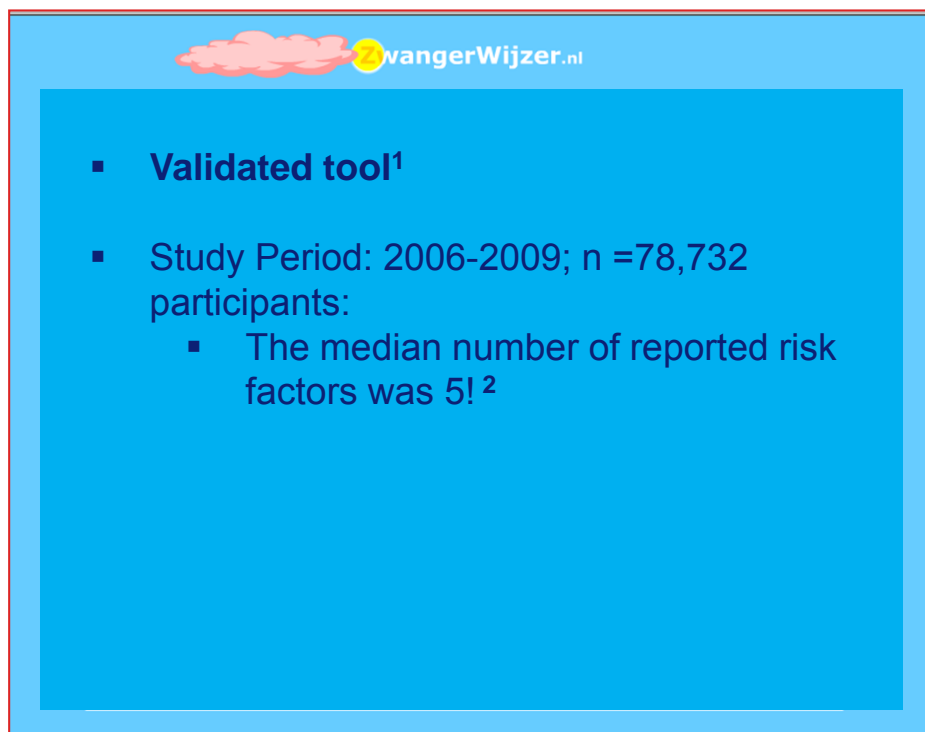
# Delivery of Preconception care

## Tools

### Use of questionnaires for risk assessment

Zwangerwijzer.nl

↓  
*for the public*



The screenshot shows the top of the ZwangerWijzer.nl website. It features a light blue header with the website name and a red cloud logo. Below the header is a large blue rectangular area containing a bulleted list of information about the tool.

- **Validated tool<sup>1</sup>**
- Study Period: 2006-2009; n =78,732 participants:
  - The median number of reported risk factors was 5! <sup>2</sup>

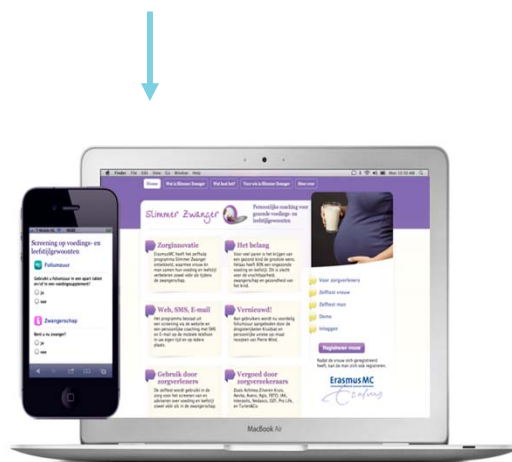
- 
- 1 AP van Landskroon et al.,  
Public health genomics 2010  
2 LCA Vink-van Os et al.,  
unpublished data

# Delivery of Preconception care

## Tools

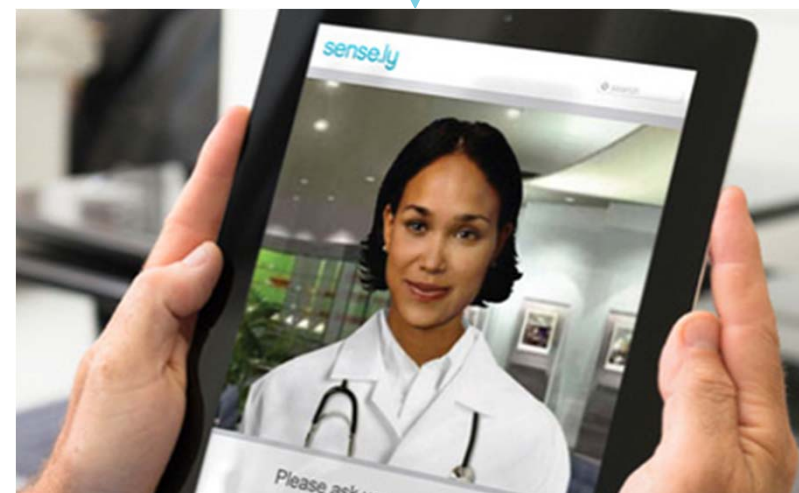
Use of e-health for risk assessment and coaching towards behavioural change

### Slimmerzwanger.nl



[www.slimmerzwanger.nl](http://www.slimmerzwanger.nl)

### Gabby



Gardiner et al., American Journal of Health Promotion, 2013

# Delivery of Preconception care

## Delivery of Individual Preconception care in different health care settings an international literature review

Approach	+	-
Primary care setting • <i>Opportunistic approach</i>	Outreach	Relies on motivation and specific knowledge of primary care givers
Hospital based PCC • <i>Opportunistic approach</i>	Outreach to couples utilizing care  Efficient	Requires monitoring of quality and consistency of care
PCC clinic • <i>Referral/ voluntary application</i>	Overcomes time restraints	Requires a refferal strategy
High risk care • <i>Community outreach strategy</i>	Serves individuals outside of the scope of routine care	Requires investing in target strategies  Requires more extensive interventions

# Delivery of Preconception care

## Organisation of Preconception Care

### Collective measures

#### Challenges:

- Outreach:
  - Target strategies
  - Group education sessions



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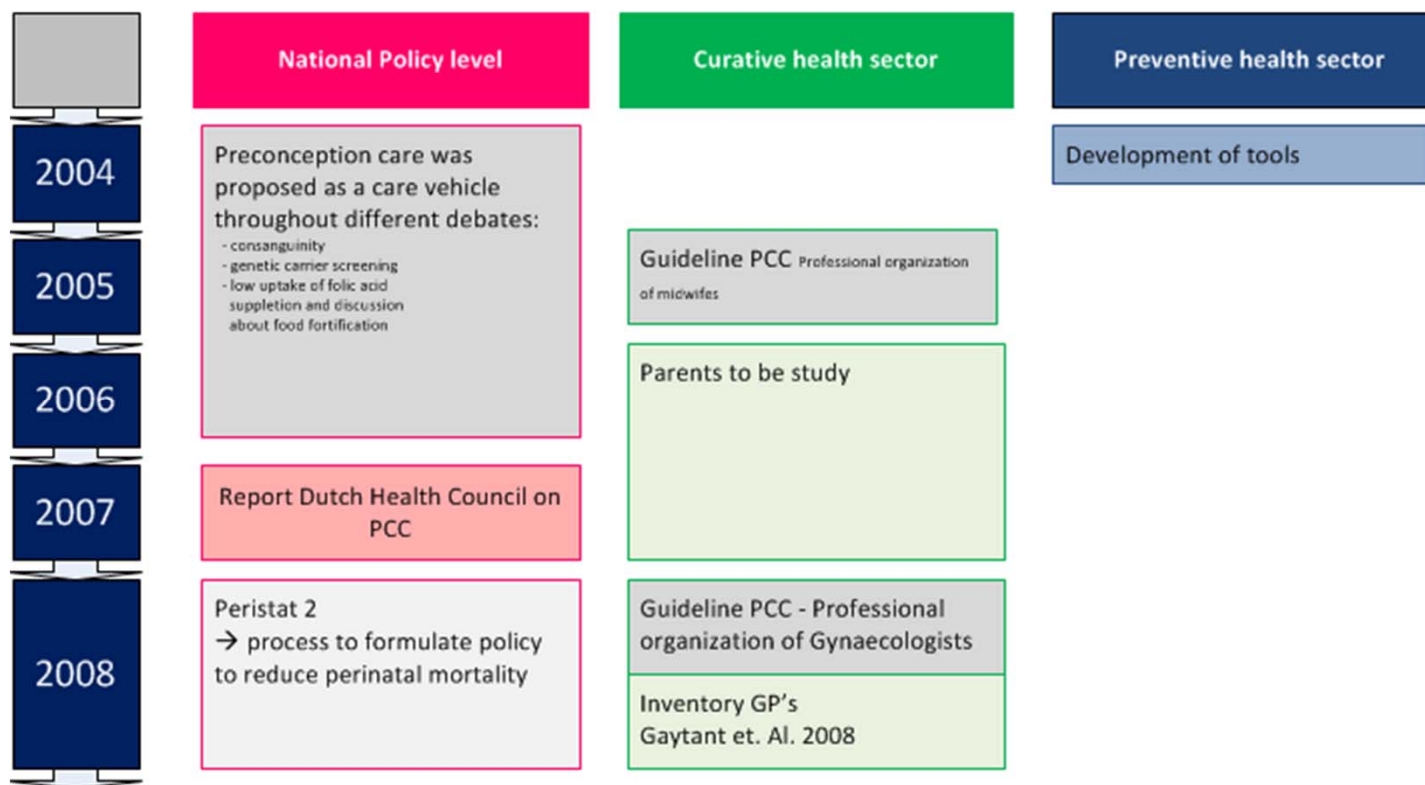
## Preconception care in the Netherlands



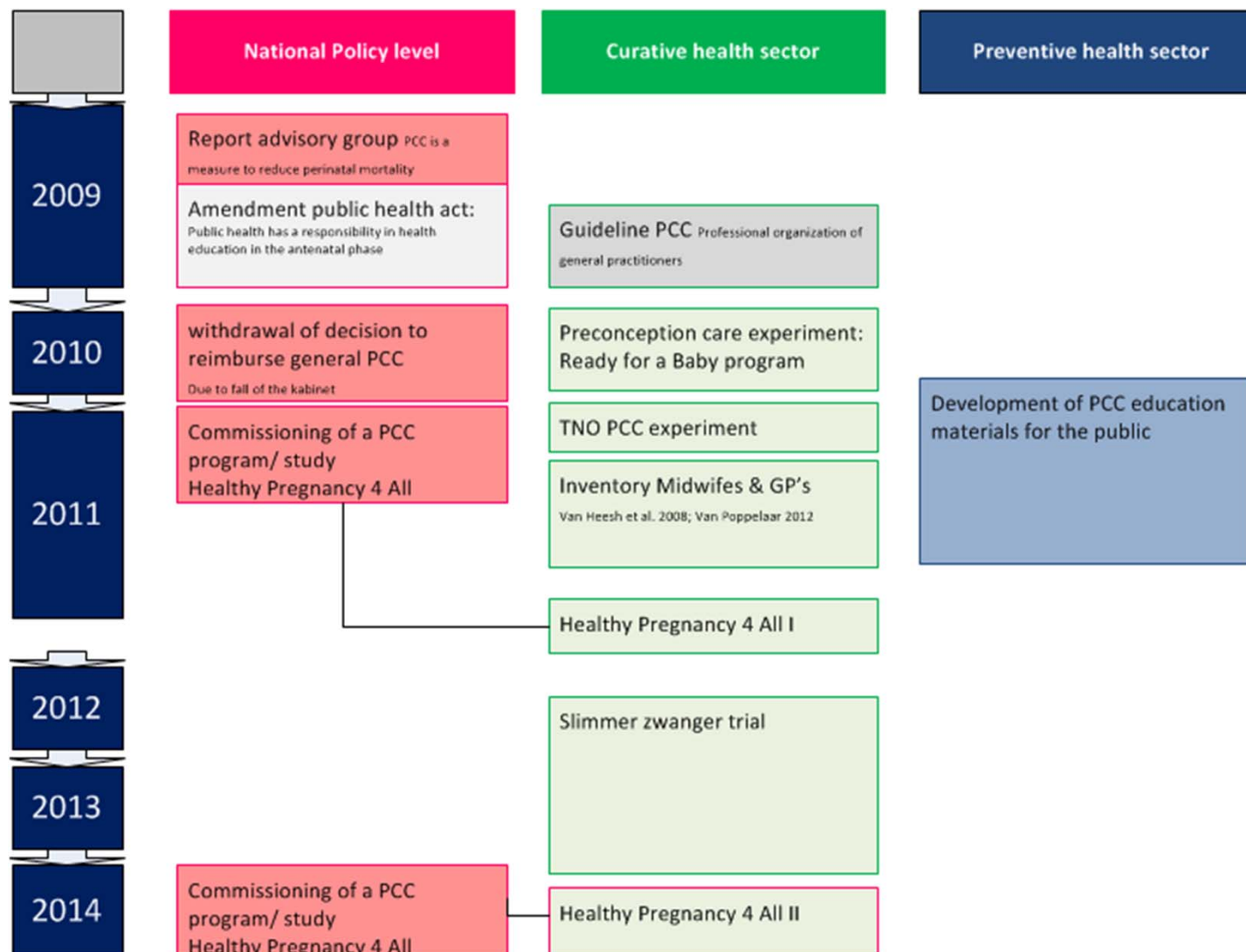
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# ■ Preconception care in the Netherlands







# Pilot preconception care



Rotterdam 2009 - 2011

## Objectives:

1. Campaign → awareness about preconception care
2. Group sessions → outreach towards high risk population
3. Individual PCC consultations in primary care

## Outcomes:

- Group sessions succesful
- N =11 PCC consultations
- Valuable: collaboration between municipality/ professionals in the field of antenatal health care





## Experimenting with Programmatic Preconception Care in 14 High Risk Municipalities in the Netherlands

Erasmus MC  
*Erasmus*

### Objectives

1. Assessment of the efficacy of programmatic preconception care
2. Assessment of the outreach of a multilevel recruitment approach
3. Identification of factors crucial to successful implementation of preconception care

### Design

Cohort study in 14 high risk municipalities

### Population

Women aged 18- 41

### Intervention

Individual preconception care

- Midwives
- General Practitioners

Tools



Denktas et al., Pregnancy and childbirth 2014

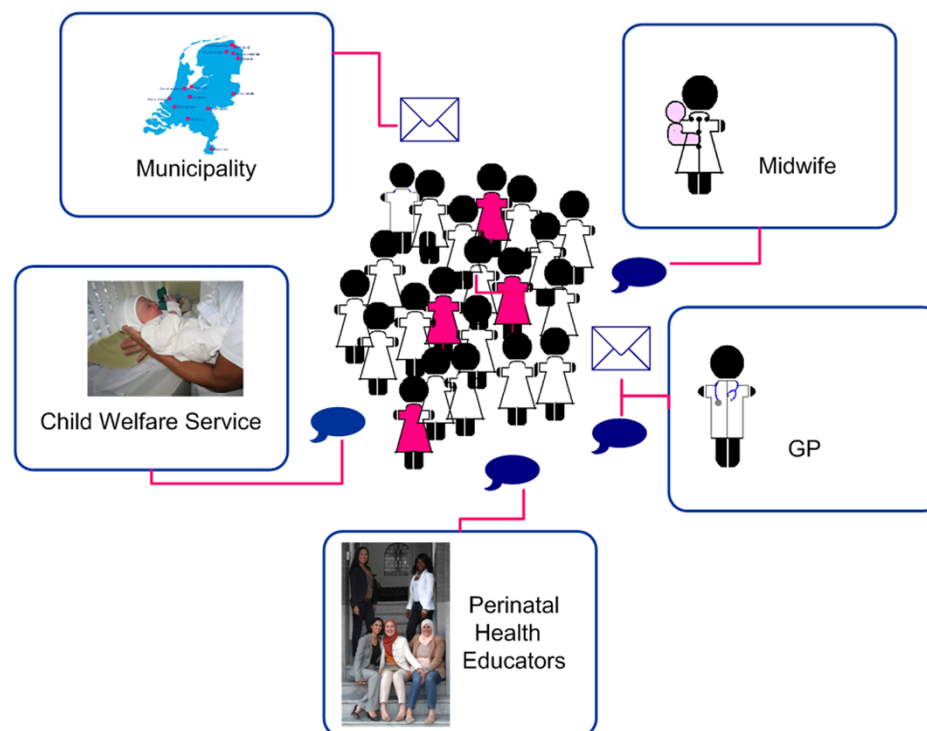
Van Voorst et al., BMJ open, accepted for publication September 2014



## Experimenting with Programmatic Preconception Care in 14 High Risk Municipalities in the Netherlands



### Recruitment



### Outcomes

Cohort includes +- 400 women  
1047 women visited group sessions  
More results → 2015



