PHG Needs Assessment Calculator
Paraguay
Preconception Care and Screening

Welcome to the PHG Health Needs Assessment Calculator for Preconception Care and Screening. The contents of this file are listed below.

Full name of the sheet	Short name
Country demographic, maternal health and socioeconomic indicators	Demography
Country health-service data	HealthServices
Risk factors for congenital disorders in women of reproductive age	PCCS-NA1.1
Population prevalence and variation for genetic conditions	PCCS-NA1.2
Effect of folic acid fortification on birth incidence of congenital heart disease	PCCS-CHD
Effect of maternal age on birth incidence of Down's syndrome	PNS-DOWNS
Effect of preconception care on fetal alcohol spectrum disorders	PCCS-FASD
Effect of preconception folic acid fortification and supplementation on neural tube defects	PCCS-NTD
Effect of preconception care on incidence of orofacial clefts	PNS-OFC
Effect of immunisation on rubella incidence in women	PNS-RUB
Effect of preconception screening and treatment on incidence of syphilis	PNS-SYPH
Effect of preconception care on congenital disorders caused by teratogens	PNS-TER

Paraguay
Shared Data
Demographic, maternal health and socio-economic indicators

Please read first! If you have already completed a needs assessment for a different topic in this country, you will be able to copy the Demography information from that Calculator into here. The information should be the same.

By default, the Toolkit contains information at the national level.
If you would like to use a different population, then replace country information with that of your specific population of interest.

Number of persons by age-group and sex	Estimates			Your estimates			Chosen estimates		
Age group	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4 years	403029	333625	736654			0			0
5-9 years	397235	323961	721196			0			0
10-14 years	379152	320242	699394			0			0
15-19 years	362753	307235	669988			0			0
20-24 years	345955	278249	624204			0			0
25-29 years	332339	214627	546966			0			0
30-34 years	286922	143117	430039			0			0
35-39 years	235140	122625	357765			0			0
40-44 years	209282	121442	330724			0			0
45-49 years	179954	113009	292963			0			0
50-54 years	152699	99748	252447			0			0
55-59 years	124241	84125	208366			0			0
60-64 years	90237	64228	154465			0			0
65+ years	182438	133032	315470			0			0
Total	3681376	2659265	6340641	0	0	0	0	0	0
Female population aged 15-44 years		1187295			-			-	
Data year	in 2011								
Source, Year	UN 2011								

Ethnicity. Please enter data for the main ethnic groups if you are working with a population that is different from that of the country.

Ethnic group	Number	% population

Fertility and mortality	Estimate	Source, Year	Your estimate	Source, Year	Chosen estimate	Source, Year
Crude birth rate: live births (LB) / year / 1000 population	24	Unicef,				
Still birth rate (SB): Still births (SB) / year / 1000 total births	19.41	WHO, 2009				
Total births in 1000s (LB+SB) per year	157.651	Unicef,				
Infant mortality rate: infant deaths / 1000 LB / year	19.1	Unicef,				
Under-5 mortality rate: U5 deaths / 1000 LB / year	22.4	Unicef,				
Percentage births in women >35 years						
Life expectancy at birth (yrs)	72.48	Unicef,				
% of marriages consanguineous						

Maternal health	Estimate	Source, Year	Your estimate	Source, Year	Chosen estimate	Source, Year
Prenatal visits – at least 1 visit (%)	96.3	Unicef,				
Prenatal visits – at least 4 visits (%)	90.5	Unicef,				
Births attended by skilled health personnel (%)	81.9	Unicef,				
Contraception prevalence rate (%)	79.4	Unicef,				
Unmet need for family planning (%)	4.7	WHO, 2008				
Total fertility rate	2.91	Unicef,				
% home births						
% births at health care services	–	2013				
Newborn health	**Estimate**	**Source, Year**	**Your estimate**	**Source, Year**	**Chosen estimate**	**Source, Year**
Number of neonatal examinations by SBA / trained staff						
% neonatal examinations by SBA / trained staff						

Socio-economic indicators	Estimate	Year	Your	Source,	Chosen	Source,
Gross national income per capita (PPP int. $)	5310	Unicef,				
% population living on < US$1 per day	6.5	Unicef,				
Birth registration coverage (%)						
Death registration coverage (%)	75-89	WHO, 2008				

LB = live births

PPP = purchasing power parity

SBA = skilled birth attendant

Paraguay
Shared Data
Health services data

Please read first! If you have already completed a needs assessment for a different topic in this country, you will be able to copy the Health Services information from that Calculator into here. The information should be the same.

This section provides health-service-related information for your country.
By default, the Toolkit contains information at the national level.
If you would like to use a different population, then replace country information with that of your specific population of interest.

Health Expenditure	Estimate	Source, Year	Your estimate	Source, Year	Chosen estimate	Source, Year
Per capita total expenditure on health (PPP int. $)	526.5	WHO 2011				
Total expenditure on health as percentage of GDP	9.7	WHO 2011				
$)	203	WHO 2011				
External resources for health as percentage of total expenditure on health	2.6	WHO 2011				
General government expenditure on health as percentage of total expenditure on health	38.6	WHO 2011				
Out-of-pocket expenditure as percentage of private expenditure on health	91.4	WHO 2011				
Private expenditure on health as percentage of total expenditure on health	61.4	WHO 2011				
General government expenditure on health as percentage of total government expenditure	16.4	WHO 2011				

Health Workforce	Estimate	Source, Year	Your estimate	Source, Year	Chosen estimate	Source, Year
Number of nursing and midwifery personnel	10261	WHO, 2002				
Nursing and midwifery personnel density (per 10,000 population)	17.9	WHO, 2002				
Number of physicians	6355	WHO, 2002				
Physician density (per 10 000 population)	11.1	WHO, 2002				
Number of obstetricians						
Number of paediatricians						
Number of paediatric surgeons						
Number of paediatric cardiac surgeons						

Number of paediatric neurosurgeons						
Number of clinical geneticists						

Number of genetic counsellors						
Number of community health workers						
Number of skilled birth attendants (SBA)						
Density of SBA						
Number of lab staff providing cytogenetic testing						
Number of lab staff providing molecular genetics						
genetics						
Number of skilled health attendants						

Infrastructure	Estimate	Source, Year	Your estimate	Source, Year	Chosen estimate	Source, Year
Number of maternity units						
Number of services providing specialised care for people with CD						
Number of family planning services						
Number of preconception services						
Number of services providing prenatal care						
Number of services providing newborn care						
Number of facilities providing genetic services						
Number of laboratories providing cytogenetics						
Number of laboratories providing molecular genetics						
Number of laboratories providing biochemical tests for genetics						
Number of facilities for safe terminations of pregnancies for fetal defects						

PPP = purchasing power parity
GDP = gross domestic product
SBA = skilled birth attendant
CD = congenital disorders

Paraguay
Preconception care and screening
Risk factors for congenital disorders in women of reproductive age

Risk factors	Proportion of women with risk factor	Qualitative assessment*	Variation	Source
Obesity				
Diabetes				
Malnutrition				
Teratogen exposure: environmental, agricultural and				
Exposure to teratogenic prescribed and non-prescribed				
Syphilis				
Rubella susceptibility				
Rubella infection				
Other infections (e.g. CMV or HIV)				
Alcohol consumption				
Tobacco use				
Advanced maternal age (>35)				
Iodine deficiency				
Folate deficiency				
Other risk factors				

* Complete if numerical data are unavailable. Use numbers from 1 to 5, where 1 = low importance and 5 = high importance.

Paraguay
Preconception care and screening
Population prevalence and variation for genetic conditions

Condition	Prevalence per 1000 TB	Prevalence variation and high-risk populations	Tick if PCCS available	Type of PCCS available
Thalassaemias				
Sickle cell disease				
Rhesus incompatability				
G6PD deficiency				
Cystic fibrosis				
Other				

TB = total births (live births + still births)
PCCS = PreconCeption Care and Screening

Paraguay
Preconception care and screening
Effect of folic acid fortification* on birth incidence of congenital heart disease

This sheet allows you to estimate the potential reduction in CHD prevalence through fortification of food with folic acid.
Please start by entering values reflecting your current situation. If you have no fortification programme, enter 0 for coverage.
Below, you may adjust dosage and coverage levels to demonstrate the effects of different intervention scenarios.

Current situation		Notes
Present estimated CHD prevalence per 1000 TB		
Present dosage (ppm)		Range: 1.5 to 3
Present coverage of fortification		Range: 0 to 1
Baseline CHD prevalence per 1000 TB, with no folic acid fortification*[1]		

Potential scenarios, based on your present situation		
Vary dosage (ppm)		Range: 1.5 to 3
Vary proportional population coverage		Range: 0 to 1
Estimated reduction in CHDs through folic acid fortification, per 1000 TB[2]	0.000	Do not delete this value!
Resulting prevalence of CHDs after folic acid fortification, per 1000 TB[3]	0.000	Do not delete this value!

ppm = parts per million
TB = total births (live births + still births)
* The effect of folic acid on CHD is assumed to be 25% of the effect on neural tube defects.
The regression formula underlying the effect on neural tube defects is given in the NTD Calculator in this Toolkit.
** Not considering the effects of other interventions on prevalence.

[1](Present estimated prevalence-(1.07*coverage*0.25)+(0.15*ppm*coverage*0.25))/(1-0.88*coverage*0.25)))
[2]((0.25*(Baseline CHD-(1.07*coverage+0.12*baseline CHD*coverage-0.15*dosage*coverage+baseline-baseline*coverage))))
[3]Baseline CHD prevalence – estimated reduction in CHD after fortification

Effects of folic acid supplementation on CHD

Effect of supplementation (with no fortification)		Notes
Baseline prevalence with no folic acid intervention (per 1000 TB)		This can be taken from the appropriate cell above
Maximum proportional reduction (assuming 100% coverage)	0.18	This value is fixed at 0.18
Population supplementation coverage		Range: 0 to 1
Actual proportional reduction	0	Maximum proportional reduction x Coverage
Actual prevalence reduction (per 1000 TB)	0.000	Baseline prevalence x Actual proportional reduction

New prevalence	0.000	Baseline prevalence -((Maximum prop. Reduction x Population supplementation coverage) x Baseline prevalence))
% prevalence reduction	#DIV/0!	1-(New prevalence/Baseline prevalence)
Absolute prevalence reduction (per 1000 TB)	0.000	Baseline prevalence -New prevalence

Now you can see below the potential combined effect of folate fortification and supplementation:

Additional effect of supplementation, given fortification	0.1	This value can be changed.

	New prevalence	
After fortification		This can be taken from the appropriate cell above
After supplementation	0.000	Same as new prevalence
After fortification and supplementation		Prevalence after fortification-(Additional effect of supplementation*prevalence after supplementation)

TB = total births (live births + still births)
CHD = congenital heart disease

Paraguay
Preconception care and screening
Effects of maternal age on incidence of Down's syndrome

If you have an estimate for the birth prevalence of Down's syndrome, you can use the Calculator on the left.
If you have an estimate of the proportion of births that are to mothers aged over 35, you can use the Calculator on the right.

Birth prevalence per 1000 TB		
Proportional birth prevalence due to high maternal age[1]	#DIV/0!	
Birth prevalence attributable to high maternal age, per 1000 TB[2]	-0.86	
Baseline prevalence without maternal age effect	0.86	This figure is set at 0.86

Proportion of mothers aged >35		Range: 0 to 1
Estimated birth prevalence per 1000 TB[3]	0.86	
Proportional birth prevalence due to high maternal age[4]	0.00	
Birth prevalence attributable to high maternal age, per 1000 TB[5]	0	
Baseline prevalence without maternal age effect	0.86	This figure is set at 0.86

TB = total births (live births + still births)

[1](Birth prevalence – 0.86)/Birth prevalence

[2]Birth prevalence – Baseline prevalence

[3]0.86+(7*Proportion of mothers aged >35)
[4] (Estimated birth prevalence- Baseline prevalence)/Estimated birth prevalence
[5] Estimated birth prevalence*Proportional birth prevalence

Paraguay
Preconception care and screening
Effect of preconception care on fetal alcohol spectrum disorders

Baseline prevalence of FASD per 1000 total births (live + still)		
Baseline prevalence of unsafe alcohol consumption in women aged 15-44 per 1000		
Variables		
Proportion of women reducing alcohol consumption to safe levels before conception		Range: 0 to 1
Effectiveness of preconception intervention on the outcome		Range: 0 to 1
Results		
% prevalence reduction due to preconception intervention per 1000 total births[1]	0%	
Final prevalence of unsafe alcohol consumption in women aged 15-44 per 1000[2]	0.00	
Final prevalence of FASD per 1000 births[3]	0.00	

FASD = fetal alcohol spectrum disorder

[1] Prop. Women reducing alcohol consumption x Effectiveness of intervention
[2] Baseline prevalence of unsafe alcohol consumption - (% prevalence reduction due to intervention X baseline prevalence of unsafe alcohol consumption)
[3] Baseline prevalence of FASD - (% prevalence reduction due to preconception intervention X Baseline prevalence of FASD)

Paraguay
Preconception care and screening
Effect of preconception folic acid fortification and supplementation on neural tube defects

This sheet allows you to estimate the potential reduction in NTD prevalence through fortification of food with folic acid and supplementation.
Please start by entering values reflecting your current situation. If you have no fortification programme, enter 0 for coverage.
Below, you may adjust dosage and coverage levels to demonstrate the effects of different intervention scenarios.

Current situation		Notes
Present estimated NTD prevalence per 1000 TB		
Present dosage (ppm)		Range: 1.5 to 3
Present coverage of fortification		Range: 0 to 1
Baseline NTD prevalence per 1000 TB, with no folic acid fortification*[1]		
Minimum prevalence NTD / 1000 births	0.9	This value is fixed at 0.9

Potential scenarios, based on your present situation		
Vary dosage (ppm)		Range: 1.5 to 3
Vary proportional population coverage		Range: 0 to 1
Estimated NTD prevalence with this scenario, per 1000 TB[2]		<- Do not modify this cell!
Absolute prevalence reduction with this scenario, per 1000 TB[3]		<- Do not modify this cell!

ppm = parts per million
TB = total births (live births + stillbirths)
* Not considering the effects of other interventions on prevalence.

[1]IF(B10="";"";IF(((B10-(1.07*B12)+(0.15*B11*B12))/(1-0.88*B12))<B15;B15;((B10-(1.07*B12)+(0.15*B11*B12))/(1-0.88*B12))))
[2] IF(B13="";"";IF(B13=0.9;0.9;IF((1.07*B19+0.12*B13*B19-0.15*(IF(B18="";B11;B18))*B19+B13-B13*B19)<B15;B15;(1.07*B19+0.12*B13*B19-0.15*(IF(B18="";B11;B18))*B19+B13-B13*B19))))
[3]IF(B20="";"";B13-B20)

See sheet NTD-Appx for explanation of regression.

NTD Interventions 2: Effect of folic acid supplementation

This sheet allows you to estimate the potential reduction in NTD incidence through folic acid supplementation for pregnant women.
Please enter a value for population coverage of folic acid supplementation, to determine its potential effect.

Effect of supplementation (with no fortification)		Notes
Baseline prevalence with no folic acid intervention (per 1000 TB)		This can be taken from the appropriate cell (baseline NTD prevalence) in sheet NTD-Interv1.
coverage)	0.72	This value is fixed at 0.72
Population supplementation coverage		Range: 0 to 1
Actual proportional reduction	0	Maximum proportional reduction x Coverage
Actual prevalence reduction (per 1000 TB)	0.000	Baseline incidence x Actual proportional reduction
Minimum prevalence	0.9	This value is fixed at 0.9
New prevalence	0.000	Baseline prevalence-((Maximum proportional reduction X Population supplementation coverage) x Baseline prevalence)
% prevalence reduction	#DIV/0!	1 – (New prevalence/Baseline prevalence)
Absolute prevalence reduction (per 1000 TB)	0.000	Baseline prevalence- New prevalence
Final prevalence following supplementation	0.900	Cannot go below 0.9 / 1000 LB

Now you can see below the potential combined effect of folate fortification and supplementation:

Additional effect of supplementation, given fortification		This value can be changed.
	New prevalence	
After fortification		This value set in sheet NTD-Interv1
After supplementation		
After fortification and supplementation	0.000	Requires input in blank cells above[1]
% reduction	#DIV/0!	Requires input in blank cells above[2]
Final prevalence after fortification and supplementation		

TB = total births (live births + stillbirths)

[1]New Prevalence after fortification-(Additional effect of supplementation x Final prev. following supplemen.)

[2]If New prevalence after fortification < minimum prevalence then use (Baseline prev – min prevalence)/baseline prevalence)
Otherwise use: (Baseline prevalence – new prevalence after fortification and supplementation)/baseline prevalence

Paraguay
Preconception care and screening
Effect of preconception care on incidence of orofacial clefts

OFC Interventions 1: Effect of folic acid fortification*

This sheet allows you to estimate the potential reduction in OFC prevalence through fortification of food with folic acid.
Please start by entering values reflecting your current situation. If you have no fortification programme, enter 0 for coverage.
Below, you may adjust dosage and coverage levels to demonstrate the effects of different intervention scenarios.

Current situation		Notes
Present estimated OFC prevalence per 1000 TB		
Present dosage (ppm)		Range: 1.5 to 3
Present coverage of fortification		Range: 0 to 1
[1]Baseline OFC prevalence per 1000 TB, with no folic acid fortification**		

Potential scenarios, based on your present situation		
Vary dosage (ppm)		Range: 1.5 to 3
Vary proportional population coverage		Range: 0 to 1
Estimated reduction in OFCs through folic acid fortification, per 1000 TB[2]	0.000	Do not delete this value!
Resulting prevalence of OFCs after folic acid fortification, per 1000 TB	0.000	Do not delete this value!

ppm = parts per million
TB = total births (live births + still births)
* The effect of folic acid on OFCs is assumed to be 25% of the effect on neural tube defects.
The regression formula underlying the effect on neural tube defects is given in the NTD Calculator in this Toolkit.
** Not considering the effects of other interventions on prevalence.

[1](Present estimated prevalence-(1.07*coverage*0.25)+(0.15*ppm*coverage*0.25))/(1-0.88*coverage*0.25)))
[2]((0.25*(Baseline OFC-(1.07*coverage+0.12*baseline OFC*coverage-0.15*dosage*coverage+baseline-baseline*coverage))))
[3]Baseline OFC prevalence – estimated reduction in OFC after fortification

OFC Interventions 2: Effect of folic acid supplementation

Effect of supplementation (with no fortification)		Notes
Baseline prevalence with no folic acid intervention (per 1000 TB)		This can be taken from the appropriate cell above
Maximum proportional reduction (assuming 100% coverage)	0.18	This value is fixed at 0.18
Population supplementation coverage		Range: 0 to 1
Actual proportional reduction	0	Maximum proportional reduction x Coverage
Actual prevalence reduction (per 1000 TB)	0.000	Baseline incidence x Actual proportional reduction

New prevalence	0.000	Baseline prevalence with no intervention -((Maximum prop. Reduction x Pop. Supp. Coverage) X Baseline prevalence)
% prevalence reduction	#DIV/0!	1-(New prevalence/Baseline prevalence)
Absolute prevalence reduction (per 1000 TB)	0.000	Baseline prevalence – New prevalence

Now you can see below the potential combined effect of folate fortification and supplementation:

Additional effect of supplementation, given fortification		This value can be changed.

	New prevalence	
After fortification		This can be taken from the appropriate cell (resulting OFC prevalence)
After supplementation	0.000	Requires input in blank cells above
After fortification and supplementation[1]		Requires input in blank cells above

TB = total births (live births + still births)
OFC = orofacial clefts

[1]Prevalence after fortification-(Additional effect of supplementation*prevalence after supplementation)

Paraguay
Preconception care and screening
Effect of immunisation on rubella incidence in women

Baseline prevalence of rubella in women aged 15-44 per 1000		
Variables		
Coverage of rubella immunisation		Range: 0 to 1
Proportion of women of reproductive age receiving immunisation		Range: 0 to 1
Effectiveness of immunisation (proportion of cases prevented among those immunised)		Range: 0 to 1
Results		
% prevalence reduction due to immunisation[1]	0%	
Prevalence reduction due to immunisation, per 1000 women aged 15-44[2]	0.000	
Final prevalence of rubella in women aged 15-44 per 1000[3]	0.000	

TB = total births (live births + still births)

[1] (Coverage of immunisation X Proportion of women receiving immunisation) X Effectiveness of immunisation
[2] % prevalence reduction due to immunisation X Baseline prevalence of rubella in women
[3] Baseline prevalence of rubella in women – Prevalence reduction due to immunisation

Paraguay
Preconception care and screening
Effect of preconception screening and treatment on incidence of syphilis

Baseline prevalence of syphilis in pregnancy per 1000 TB		
Variables		
Coverage of preconception screening		Range: 0 to 1
Proportion of diagnosed cases receiving timely treatment		Range: 0 to 1
Effectiveness of treatment (proportion of cases prevented among those treated)		Range: 0 to 1
Results		
% prevalence reduction due to PCCS & treatment[1]	0%	
Prevalence reduction due to PCCS & treatment, per 1000 TB[2]	0.000	
Final prevalence of syphilis in pregnancy after PCCS & treatment, per 1000 TB[3]	0.000	

PCCS = preconception care and screening

TB = total births (live births + still births)

[1] (Coverage of screening X Proportion of women receiving treatment) X Effectiveness of treatment

[2] % prevalence reduction due to PCCS and treatment X Baseline prevalence of syphilis in pregnancy

[3] Baseline prevalence of syphilis in pregnancy – Prevalence reduction due to PCCS and treatment

Paraguay
Preconception care and screening
Effect of preconception care on congenital disorders caused by teratogens

Baseline prevalence of teratogen-induced congenital disorders per 1000 total births (live + still)		
Variables		
Proportion of women reducing teratogen risk to safe levels prior to pregnancy		Range: 0 to 1
Effectiveness of interventions on the outcome		Range: 0 to 1
Results		
% prevalence reduction due to intervention per 1000 total births[1]	0%	
Final prevalence of teratogen-induced congenital disorders per 1000 births[2]	0.000	

[1]Proportion of women reducing teratogen risk to safe levels prior to pregnancy x Effectiveness if outcome
[2]Baseline prevalence - (% prevalence reduction due to intervention X Baseline prevalence)