PHG Needs Assessment Calculator
Papua New Guinea
Prenatal care and screening

Welcome to the PHG Health Needs Assessment Calculator for Prenatal 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 pregnant women	PNS-NA1.1
Population prevalence and variation for congenital disorders	PNS-NA1.2
Effect of PNS and treatment on prevalence of congenital heart disease	PNS-CHD
Effect of PNS and pregnancy termination on birth prevalence of Down's syndrome	PNS-DOWNS
Effect of PNS and pregnancy termination on birth prevalence of neural tube defects	PNS-NTD
Effect of PNS and management on birth incidence of fetal alcohol spectrum disorders	PNS-FASD
Effect of PNS on birth prevalence of rhesus haemolytic disease	PNS-RHD
Effect of PNS and pregnancy management on congenital rubella syndrome	PNS-RUB
Effect of PNS and treatment on birth prevalence of syphilis	PNS-SYPH
Effect of PNS and pregnancy termination on birth prevalence of sickle cell disease	PNS-SCD
Effect of PNS and pregnancy termination on birth prevalence of thalassaemias	PNS-THAL
Effect of PNS on congenital disorders caused by teratogens	PNS-TER

Papua New Guinea
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	377776	348904	726680			0			0
5-9 years	381339	346031	727370			0			0
10-14 years	330965	289909	620874			0			0
15-19 years	293277	261204	554481			0			0
20-24 years	239863	234938	474801			0			0
25-29 years	219680	228734	448414			0			0
30-34 years	191662	192598	384260			0			0
35-39 years	166656	163681	330337			0			0
40-44 years	128910	123458	252368			0			0
45-49 years	104867	93890	198757			0			0
50-54 years	79899	71114	151013			0			0
55-59 years	59308	49400	108708			0			0
60-64 years	48530	40973	89503			0			0
65+ years	69012	54208	123220			0			0
Total	0	0	5190786	0	0	0	0	0	0
Female population aged 15-44 years		0			0			0	
Data year			2000 reported in 2004						
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	30	Unicef, 2007				
Still birth rate (SB): Still births (SB) / year / 1000 total births	15	WHO, 2009				
Total births in 1000s (LB+SB) per year	190.00	Unicef, 2007				
Infant mortality rate: infant deaths / 1000 LB / year	47.00	UNICEF (2011), 2010				
Under-5 mortality rate: U5 deaths / 1000 LB / year	61.00	UNICEF (2011), 2010				
Percentage births in women >35 years						
Life expectancy at birth (yrs)	63	WHO, 2009				
% of marriages consanguineous						

Maternal health	Estimate	Source, Year	Your estimate	Source, Year	Chosen estimate	Source, Year
Prenatal visits – at least 1 visit (%)	79	WHO, 2006				
Prenatal visits – at least 4 visits (%)	55	WHO, 2006				
Births attended by skilled health personnel (%)	53	WHO, 2006				
Contraception prevalence rate (%)	35.7	WHO, 2006				
Unmet need for family planning (%)						
Total fertility rate	4	WHO, 2009				
% home births						
% births at health care services						
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	Source, Year	Your estimate	Source, Year	Chosen estimate	Source, Year
Gross national income per capita (PPP int. $)	2030	WHO, 2008				
% population living on < US$1 per day						
Birth registration coverage (%)						
Death registration coverage (%)						

LB = live births
PPP = purchasing power parity
SBA = skilled birth attendant

Papua New Guinea
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. $)	71	WHO, 2009				
Total expenditure on health as percentage of GDP	3.1	WHO, 2009				
Per capita government expenditure on health (PPP int. $)	56	WHO, 2009				
External resources for health as percentage of total expenditure on health	20.0	WHO, 2009				
General government expenditure on health as percentage of total expenditure on health	79.0	WHO, 2009				
Out-of-pocket expenditure as percentage of private expenditure on health	40.5	WHO, 2009				
Private expenditure on health as percentage of total expenditure on health	21.0	WHO, 2009				
General government expenditure on health as percentage of total government expenditure	8.0	WHO, 2009				

Health Workforce	Estimate	Source, Year	Your estimate	Source, Year	Chosen estimate	Source, Year
Number of nursing and midwifery personnel	3159	WHO, 2008				
Nursing and midwifery personnel density (per 10,000 population)	5.1	WHO, 2008				
Number of physicians	333	WHO, 2008				
Physician density (per 10 000 population)	0.53	WHO, 2008				
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						
Number of lab staff providing biochemical tests for 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 facillities for safe terminations of pregnancies for fetal defects						

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

Papua New Guinea

Prenatal care and screening

Risk factors for congenital disorders in pregnant women*

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

* If data on pregnant women are not available, use estimates for women of reproductive age and please indicate this.
** Complete if numerical data are unavailable. Use numbers from 1 to 5, where 1 = low importance and 5 = high importance.
TB = total births (live births + still births)

Papua New Guinea
Prenatal care and screening
Population prevalence and variation for congenital disorders

Condition	Prevalence of affected pregnancies per 1000 TB	Birth prevalence per 1000 TB	Prevalence variation and high-risk populations	Tick if PNS available	Type of PNS available	Coverage of PNS	Tick if public ToP services available
Rhesus incompatibility/ disease							
G6PD deficiency							
Thalassaemia							
Sickle cell disease							
Chromosomal disorders							
Structural disorders							
Other							

PNS = Prenatal screening, e.g. carrier screening, membership of high-risk population, ultrasound, other tests
TB = total births (live births + still births)
ToP = termination of pregnancy

Papua New Guinea
Prenatal care and screening
Effect of PNS and treatment on prevalence of congenital heart disease

Baseline prevalence: fetuses affected by CHD, per 1000 TB		
Variables		
Coverage of prenatal screening		Range: 0 to 1
Proportion of diagnosed pregnancies receiving treatment*		Range: 0 to 1
Effectiveness of treatment		Range: 0 to 1
Results		
Proportional reduction of uncontrolled cases of CHD through PNS and treatment[1]	0%	
Prevalence of uncontrolled CHD after PNS and treatment, per 1000 total births[2]	0.000	
Final prevalence: affected live births after PNS & treatment, per 1000 total births[3]	0.000	

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

*Treatment in this case refers to diagnosis and appropriate management of pregnancy

[1]Coverage of screening X Proportion of diagnosed pregnancies receiving treatment X Effectiveness of treatment
[2]Proportional reduction of uncontrolled cases x Baseline prevalence
[3]Baseline prevalence – prevalence of uncontrolled CHD

Papua New Guinea
Prenatal care and screening
Effect of PNS and ToP on birth prevalence of Down's Syndrome*

Note: this makes the simplifying assumption that still birth is equally likely in cases that are diagnosed as in cases that are not diagnosed.

Baseline prevalence: affected pregnancies per 1000 TB		
Variables		
Coverage of prenatal screening		Range: 0 to 1
Proportion of screen-positve cases receiving fetal diagnosis		Range: 0 to 1
Proportion of diagnosed cases ending in pregnancy termination		Range: 0 to 1
Results		
% prevalence reduction due to PNS & pregnancy termination[1]	0%	
Prevalence reduction due to PNS & pregnancy termination, per 1000 TB[2]	0.000	
Final prevalence: affected live births after PNS & pregnancy termination, per 1000 TB[3]	0.000	

PNS = prenatal screening
TB = total births (live births + still births)
ToP = termination of pregnancy

* If you want to consider all chromosomal disorders please enter relevant data.

[1]Coverage of screening X Proportion of screen-positive cases receiving diagnosis x Proportion of cases ending in pregnancy termination
[2]% prevalence reduction due to PNS and ToP x Baseline prevalence : affected pregnancies
[3]Baseline prevalence of affected pregnancies – Prevalence reduction due to PNS & ToP

Papua New Guinea
Prenatal care and screening
Effect of PNS and pregnancy termination on prevalence of neural tube defects

Below you can 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)		
Maximum proportional reduction (assuming 100% 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 coverage 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

Assumption: prenatal services are equally used for cases which would lead to still births (SB) and live births (LB).
This could overestimate the impact of ToP if in fact ToP is more likely for severe cases that would result in stillbirth.
Conversely, the impact of ToP could be underestimated if screening is only available to high-income women at lower risk.

Baseline prevalence, per 1000 TB (LB+SB)		Use baseline either before or after folic acid interventions.
Variables		
Coverage of prenatal screening		Range: 0 to 1
Proportion of screen-positive cases receiving diagnosis		Range: 0 to 1
Proportion of diagnosed cases ending in pregnancy termination		Range: 0 to 1
Results		
% prevalence reduction due to PND & pregnancy termination[1]	0%	
Prevalence reduction due to PND & pregnancy termination, per 1000 TB[2]	0.000	
Final birth prevalence of NTDs after PND & pregnancy termination, per 1000 TB[3]	0.000	

PND = prenatal diagnosis
TB = total births (live births + still births)
NTDs = neural tube defects
[1]Coverage of screening X Proportion of screen-positive cases receiving diagnosis x Proportion of cases ending in pregnancy termination
[2]% prevalence reduction due to PND and termination x Baseline prevalence
[3]Baseline prevalence – Prevalence reduction due to PND & termination

Papua New Guinea
Prenatal care and screening
Effect of PNS and management on birth incidence of fetal alcohol spectrum disorders

Baseline prevalence of FASD per 1000 total births (live + still)		
Baseline prevalence of unsafe alcohol consumption in pregnant women per 1000		
Variables		
Proportion of women stopping drinking or reducing to safe levels during pregnancy		Range: 0 to 1
Effectiveness of intervention in pregnancy on the outcome		Range: 0 to 1
Results		
% prevalence reduction due to in-pregnancy intervention per 1000 total births[1]	0%	
Final prevalence of FASD per 1000 births[2]	0.000	
Final prevalence of unsafe alcohol consumption in pregnant women per 1000[3]	0.000	

FASD = fetal alcohol spectrum disorder

[1]Prop. women stopping drinking or reducing to safe levels during pregnancy x Effectiveness of intervention
[2]Baseline prevalence of FASD - (% prevalence reduction due to in-pregnancy intervention X Baseline prevalence of FASD)
[3]Baseline prevalence of unsafe alcohol consumption - (% prevalence reduction due to intervention X Baseline prevalence of unsafe alcohol consumption)

Papua New Guinea
Prenatal care and screening
Effect of PNS on birth prevalence of RHD

Baseline prevalence of RHD per 1000 TB		
Variables		
Coverage of prenatal screening		Range: 0 to 1
Proportion of RhD negative women receiving anti-D		Range: 0 to 1
Effectiveness of anti-D in RhD negative women		Range: 0 to 1
Results		
% prevalence reduction due to PNS & treatment[1]	0%	
Prevalence reduction due to PNS & treatment, per 1000 TB[2]	0.000	
Final prevalence of RHD-affected live births and still births after PNS & treatment, per 1000 TB[3]	0.000	

RHD = Rhesus Haemolytic Disease of the Newborn
PNS = prenatal screening
TB = total births (live births + still births)

[1](Coverage of PNS X Proportion of women receiving anti-D) X Effectiveness of anti-D
[2]% prevalence reduction due to PNS and treatment X Baseline prevalence of RHD
[3]Baseline prevalence of RHD – Prevalence reduction due to PNS and treatment

Papua New Guinea
Prenatal care and screening
Effect of PNS and management on CRS

Baseline prevalence: fetuses affected by CRS, per 1000 TB		
Variables		
Coverage of prenatal screening		Range: 0 to 1
Proportion of diagnosed pregnancies receiving treatment*		Range: 0 to 1
Effectiveness of treatment		Range: 0 to 1
Results		
Proportional reduction of uncontrolled cases of CRS through PNS and treatment[1]	0%	
Prevalence of uncontrolled CRS after PNS and treatment, per 1000 total births[2]	0.000	
Final prevalence of CRS-affected live births after PNS & treatment, per 1000 TB[3]	0.000	

PNS = prenatal screening
TB = total births (live births + still births)
CRS = congenital rubella syndrome

*Treatment in this case refers to diagnosis and appropriate management of pregnancy

[1](Coverage of PNS X Proportion of diagnosed pregnancies receiving treatment) X Effectiveness of treatment
[2]Proportional reduction in uncontrolled cases of CRS due to PNS and treatment X Baseline prevalence
[3]Baseline prevalence – Prevalence reduction due to PNS and treatment

Papua New Guinea
Prenatal care and screening
Effect of PNS and treatment on birth prevalence of syphilis

Baseline prevalence of syphilis in pregnancy per 1000 TB		
Variables		
Coverage of prenatal maternal 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 PNS & treatment[1]	0%	
Prevalence reduction due to PNS & treatment, per 1000 TB[2]	0.000	
Final prevalence of syphilis-affected pregnancies per 1000 TB[3]	0.000	

PNS = prenatal screening
TB = total births (live births + still births)

[1](Coverage of maternal screening X Proportion of diagnosed women receiving treatment) X Effectiveness of treatment
[2]% prevalence reduction due to PNS and treatment X Baseline prevalence of syphilis in pregnancy
[3]Baseline prevalence of syphilis in pregnancy – Prevalence reduction due to PNS and treatment

Papua New Guinea
Prenatal care and screening
Effect of PNS and ToP on birth prevalence of sickle cell disease

Baseline prevalence: affected fetuses per 1000 TB		
Variables		
Coverage of prenatal screening		Range: 0 to 1
Proportion of positive-screened cases receiving fetal diagnosis		Range: 0 to 1
Proportion of diagnosed cases resulting in pregnancy termination		Range: 0 to 1
Results		
% prevalence reduction due to PNS & ToP[1]	0%	
Prevalence reduction due to PNS & ToP, per 1000 TB[2]	0.000	
Final birth prevalence of babies with sickle cell disease after PNS and ToP, per 1000 TB[3]	0.000	

PNS = prenatal screening
TB = total births (live births + still births)
ToP = termination of pregnancy

1(Coverage of prenatal screening x Proportion of positive-screened cases receiving fetal diagnosis) X Proportion of cases resulting in ToP
[2]% prevalence reduction due toPNS and ToP X Baseline prevalence : affected fetuses
[3]Baseline prevalence: affected fetuses – Prevalence reduction due to PNS and ToP

Papua New Guinea
Prenatal care and screening
Effect of PNS and ToP on birth prevalence of thalassaemias

Baseline prevalence: thalassaemia-affected pregnancies per 1000 TB		
Variables		
Coverage of prenatal screening		Range: 0 to 1
Proportion of positive-screened cases receiving fetal diagnosis		Range: 0 to 1
Proportion of diagnosed cases ending in pregnancy termination		Range: 0 to 1
Results		
% prevalence reduction due to PNS & ToP[1]	0%	
Prevalence reduction due to PNS & ToP, per 1000 TB[2]	0.000	
Final birth prevalence of thalassaemia-affected babies after PNS & ToP, per 1000 TB[3]	0.000	

PNS = prenatal screening
TB = total births (live births + still births)
ToP = termination of pregnancy

1(Coverage of prenatal screening x Proportion of positive-screened cases receiving fetal diagnosis) X Proportion of cases resulting in ToP
[2]% prevalence reduction due toPNS and ToP X Baseline prevalence : affected fetuses
[3]Baseline prevalence: affected fetuses – Prevalence reduction due to PNS and ToP

Papua New Guinea
Prenatal care and screening
Effect of PNS on congential 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 during 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 during pregnancy X Effectiveness of intervention on outcome		

[2]Baseline prevalence - (% prevalence reduction due to intervention X Baseline prevalence)

Effects of prenatal screening and pregnancy termination

Assumption: prenatal services are equally used for cases which would lead to still births and live births.
This could overestimate the impact of ToP if in fact ToP is more likely for severe cases that would result in still birth.
Conversely, the impact of ToP could be underestimated if screening is only available to high-income women at lower risk.
100% specificity of prenatal diagnosis assumed.

Baseline prevalence, per 1000 TB (LB + SB)*		
Variables		
Coverage of prenatal diagnosis		Range: 0 to 1
Choice of ToP in confirmed cases		Range: 0 to 1
Results		
% prevalence reduction due to PNS[3]	0%	
Prevalence reduction due to PNS[4]	0.000	
Final prevalence after PNS[5]	0.000	

*Use baseline either before or after effect of controlling teratogenic risk
PNS = prenatal screening
ToP = termination of pregnancy
TB = total births (live births + still births)

[3]Coverage of prenatal diagnosis x Choice of ToP in confirmed cases
[4]% prevalence reduction due to PNS X Baseline prevalence
[5]Baseline prevalence – Prevalence reduction due to PNS