How do we estimate case load for pregnant and lactating women 6 months postpartum in a given time period?

We start with the case of a universal program admitting **all** pregnant and lactating women (PLW). Case load can be estimated from basic demographic data (i.e. population and birth rate). This data will usually be available from census reports or from DHS survey reports. For example:

Population (both sexes) : 110,000

Birthrate : 44 / 1,000 population

In some settings, certain factors may lead to census data not being accurate (e.g. political manipulation, the absence of a functioning civil society, population displacement, and poor security). Population estimates should, therefore, be corrected by the application of estimates of population growth, for displacement, migration, and mortality in the target population.

The number of births per year can be estimated:

$$Births\ per\ year = Birthrate \times Population_{Both\ sexes} = \frac{44}{1{,}000} \times 110{,}000 = 4{,}840$$

The number of births per day can be estimated:

$$Births\ per\ day = \frac{Births\ per\ year}{365.25} = \frac{4{,}840}{365.25} = 13.25$$

If we assume a mean gestation period of 280 days (Naegele's rule) we can estimate the number of pregnant women on any one day in this population as:

$$N_{Pregnant\ women} = Births\ per\ day \times Mean\ gestation\ period = 13.25 \times 280 = 3{,}710$$

We are usually only interested in women in the second (T2) and third trimesters (T3):

$$N_{T2\ or\ T3} = N_{Pregant\ women} \times \frac{2}{3} = 3{,}710 \times \frac{2}{3} = 2{,}473$$

We usually plan to intervene during T2 and T3 (approximately six months) and for six months postpartum. This means that we plan to intervene in an equal number of women in T2 / T3 and six months postpartum:

$$N_{T2\ or\ T3\ or\ 6\ months\ postpartum} = 2 \times N_{T2\ or\ T3} = 2 \times 2{,}473 = 4{,}946$$

This is an estimate of the number of women eligible for the intervention on any one day. We can adjust this estimate to account for abortions, miscarriages, stillbirths, and mortality of mothers and children. An adjustment of between five and ten percent might be reasonable. Ideally, this would be informed by local data such as neonatal and infant mortality rates.

In the case of a selective entry program, we need to estimate the proportion of PLW who are eligible to receive the intervention. This may be estimated from survey data. If, for example, the program eligibility criteria is pregnant and lactating women with MUAC < 230 mm and the proportion of PLW who meet this criteria is estimated to be 14.2% then the number of eligible PLW on any one day will be:

$$N_{Eligible} = N_{T2\ or\ T3\ or\ 6\ months\ postpartum} \times Proportion_{Eligible} = 4{,}946 \times \frac{14.2}{100} = 702$$

We should also factor in expected coverage (including defaulting). If we expect 50% coverage (including defaulting) we would expect to have:

$$N_{In\ Program} = N_{Eligible} \times Coverage = 702 \times \frac{50}{100} = 351$$

eligible PLW in the program on any one day.

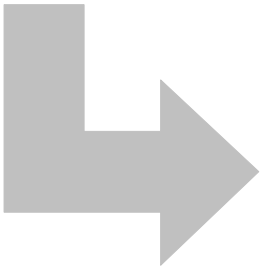
This estimate can be used to estimate, for example, logistics requirements over the duration of the program. The details of the calculations will depend on the nature of the program. If, for example, the program plans to deliver 10 kg of a fortified cereal / legume blended product (FCLB) to program beneficiaries on a monthly basis then approximately:

$$Quantity_{FCLB} = 351 \times 10 = 3{,}510\,kg$$

of FCLB will be required for each month of program operation.

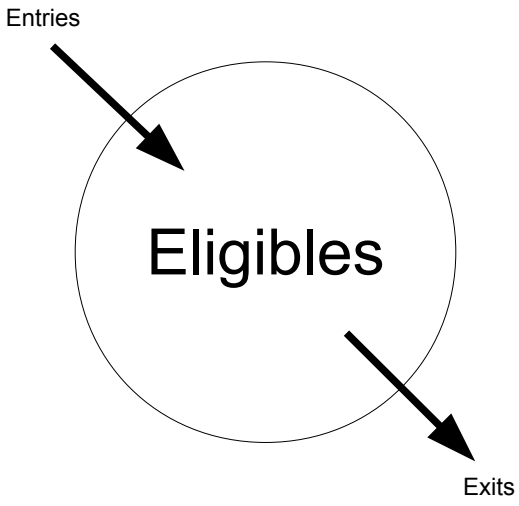
The calculations can be automated using a simple spreadsheet:

	A	B
1	Population	110000
2	Birth rate (per 1000)	44
3	Proportion eligible (%)	14.2
4	Coverage (%)	50
5		
6	Expected case-load	
		=ROUND(B1*(B2/1000)/365.25*280*(2/3)*2*(B3/100)*(B4/100))



	A	B
1	Population	110000
2	Birth rate (per 1000)	44
3	Proportion eligible (%)	14.2
4	Coverage (%)	50
5		
6	Expected case-load	351

The estimate of the number of PLW in the program on any one day can be converted into the number of PLW treated over a year (or any other period) using the following model:



With a slow changing or constant birth-rate the number of entries will match the number of exits. The number of PLW treated over a year in the example program is expected to be:

$$N_{PLW\ Treated} = N_{In\ Program} + births\ per\ day \times 365.25 \times Proportion_{Eligible} \times Coverage$$

$$N_{PLW\ Treated} = 351 + 13.25 \times 365.25 \times \frac{14.2}{100} \times \frac{50}{100} = 695$$

This FAQ response was drafted by Mark Myatt (Consultant Epidemiologist, Brixton Health) on 30th May 2012.