

Resources for Child Health



A John Snow, Inc. project

REACH

WHO/USAID (REACH) Workshop for Accelerated Control of Neonatal Tetanus

Harare, Zimbabwe
18-25 July 1988

HOW TO ASSESS TT COVERAGE THROUGH ROUTINE REPORTING (Presented by Robert Steinglass, REACH)

Reported TT coverage lags behind coverage with childhood vaccines in practically all countries. WHO estimates coverage of pregnant women within TT2 to be 12% in Africa. By comparison, reported infant coverage with DPT3 is 26%.

In 1987, the VIII International Conference on Tetanus in Leningrad and the WHO EPI Global Advisory Group Meeting in Washington both stressed the need to improve monitoring of TT coverage in light of various target groups and immunization schedules. Requirements for TT recording and reporting are discussed and monitoring tools for measuring completion rates in the TT series are presented.

Routine reporting and local analysis of immunizations performed should be done continuously in all health units and administrative areas. Although the goal of EPI is to reduce disease and mortality, disease surveillance systems in many African countries are not yet capable of reliably monitoring disease trends.

Standard 30-cluster surveys should be used to derive coverage. However, for logistic, financial and managerial reasons, it is extremely unlikely that such surveys could be conducted with the required annual frequency in each administrative area.

Largely as a result of WHO's recommendations, many countries are beginning to expand the TT target groups to include all women of childbearing age, rather than limiting TT only to pregnant women. This widened target group is especially appropriate in many African countries lacking developed antenatal services capable of reaching women during pregnancy.

Recording and reporting forms must reflect the new target groups. To monitor performance and set targets, TT immunizations should be recorded by dose (TT1, TT2, TT3, and TT booster) and by target group (pregnant women, other women of childbearing age, and other). An appropriate reporting form is given in Table 1.

Table 1: TT Reporting Form

	Pregnant women	Other women of Childbearing Age	Other (Specify)
Target Population			
TT1			
TT2			
TT3			
TT booster			

Measuring and monitoring TT coverage using routinely reported statistics is not as easy as monitoring infant coverage. Unlike in the case of infants (a cohort which renews itself annually and is consequently easily calculated), multiple doses of TT are administered with varying intervals over a 30 year reproductive span, and women enter and leave the eligible age range all the time.

To calculate coverage achieved during a single year in areas immunizing pregnant women, the following standard WHO formula can be used:

$$\text{Coverage of pregnant women with TT2 (\%)} = \frac{\text{Pregnant women receiving TT2 (plus TT3 or more)}}{\text{total number of pregnancies}}$$

This calculation helps managers gauge progress towards achievement or annual targets and gives a conservative estimate of the proportion of pregnancies which are protected. For ease of calculation, the total number of pregnancies is assumed to equal annual births. Rates of stillbirth and abortion are not considered.

TT coverage in areas immunizing all women of childbearing age must be calculated differently. Since the duration of immunity of TT2 is three years, we must accumulate in the numerator the number of TT2 immunizations given during the past three complete years. The formula should be:

$$\text{Coverage of women of childbearing age with TT2 (\%)} = \frac{\text{Pregnant women and other women of childbearing age receiving TT2 during past 3 years}}{\text{Number of women of childbearing age}} \times 100$$

The calculation gives a point prevalence of maternal protection versus a period prevalence of maternal protection in any particular year.

The need to accumulate TT2 coverage over the past three years (or, in the case of TT3, over the past five years since that is the expected duration of immunity) is illustrated in Table 2. Although all women of childbearing age have received TT2 (1.1 million TT2 doses given) during the first four years of this very successful program, the apparent annual coverage in year four is only 20% (200/1000), which is the same figure as when the program had only just begun -- despite great cumulative increases since then in terms of the female population still protected. Present methods of calculating coverage, by counting only a single year's TT2 immunization, incorrectly imply that women of childbearing age require TT2 (or more) each and every year.

In Table 2, by accumulating TT2 immunizations given over the past three years, we arrive at a cumulative TT2 coverage by year three of 90% (versus 40% in a single year using the current common formula). This correlates with the proportion of the female population protected at a given point in time.

The distribution between target numbers to be immunized in a single year and percent of the population to be protected by a certain date is important but not always appreciated by program managers. For example, in one country, a private voluntary organization covering a total population of 4287 persons established clear benchmarks for monitoring progress. One

of their final outputs of the four-year program is to reach 80% (3430) of childbearing women aged 15-45 years with TT2 by 1991. However, the yearly benchmarks are as follows:

1988:	40% of women aged 15-45 (1715)
1989:	60% of women aged 15-45 (2570)
1990:	70% of women aged 15-45 (3000)
1991:	80% of women aged 15-45 (3431)

In other words, 10,716 women are targeted for immunization. To meet these targets, staff need to immunize each woman in the community an average of two and a half times with TT2. Such an inflated set of successive yearly targets disregards past immunizations performed and overlooks the cumulative nature of coverage. Front-line health workers in such a situation become demoralized by incomprehensible and unreachable targets established by higher levels. Furthermore, the community may object repeated attempts to immunize the women. Few programs can afford the wastage in manpower and vaccine resulting from achieving such inappropriate targets.

A worksheet for calculating cumulative TT2 percent coverage in any given year by accumulating the past three years of immunization appears in Table 3.

Worksheet for Calculating TT2 Coverage of
Women of Childbearing Age:

(1987)

$$\text{Cumulative coverage of women of childbearing age with TT2 (\%)} = \frac{\text{pregnant women and other women of childbearing age receiving TT2 during past three years}}{\text{Number of women of childbearing age}} \times 100$$

Example:

Country population:	10,000,000
Target group:	women 15-44 yrs and pregnant women
Female pop 15-44 years:	2,000,000
Number of TT2 given during:	
- most recent complete year (1987)	250,000
- year before (1986)	190,000
- year before (1985)	160,000
Total (1985-1987)	600,000

$$\begin{aligned} \text{Cumulative coverage of women of childbearing age with TT2 (\%)} &= \frac{250,000+190,000+160,000}{2,000,000} \times 100 \\ &= \frac{600,000}{2,000,000} \times 100 = 30\% \end{aligned}$$

A management tool to illustrate the cumulative percent of the female population covered with two doses of TT is shown in Figure 1. The figure plotted on the graph for each year is the accumulation of TT2 immunizations given during the past three years.

Table 2:

HYPOTHETICAL TT2 IMMUNIZATION COVERAGE BY YEAR IN A COUNTRY WITH 5 MILLION POPULATION AND 1 MILLION WOMEN OF CHILDBEARING AGE ^a

Year	TT2 ('000s) given during 1 year	Apparent TT2 Coverage ^b	TT2 ('000s) given during 3 years	Cumulative TT2 Coverage ^c
1(start)	200	$20\% \left(\frac{200}{1000} \right)$	200	$20\% \left(\frac{200}{1000} \right)$
2	300	$30\% \left(\frac{300}{1000} \right)$	500	$50\% \left(\frac{500}{1000} \right)$
3	400	$40\% \left(\frac{400}{1000} \right)$	900	$90\% \left(\frac{900}{1000} \right)$
4	200	$20\% \left(\frac{200}{1000} \right)$	900	$90\% \left(\frac{900}{1000} \right)$
5	100	$10\% \left(\frac{100}{1000} \right)$	700	$70\% \left(\frac{700}{1000} \right)$

^a The population of women of childbearing age is assumed to remain constant at 50,000 unimmunized 15 year olds annually replacing 50,000 unimmunized and immunized 44 year olds.

^b Calculated according to the WHO formula (6):

$$\frac{\text{women of childbearing age receiving TT2} \times 100}{\text{total of women of childbearing age}}$$

^c Calculated according to the proposed formula:

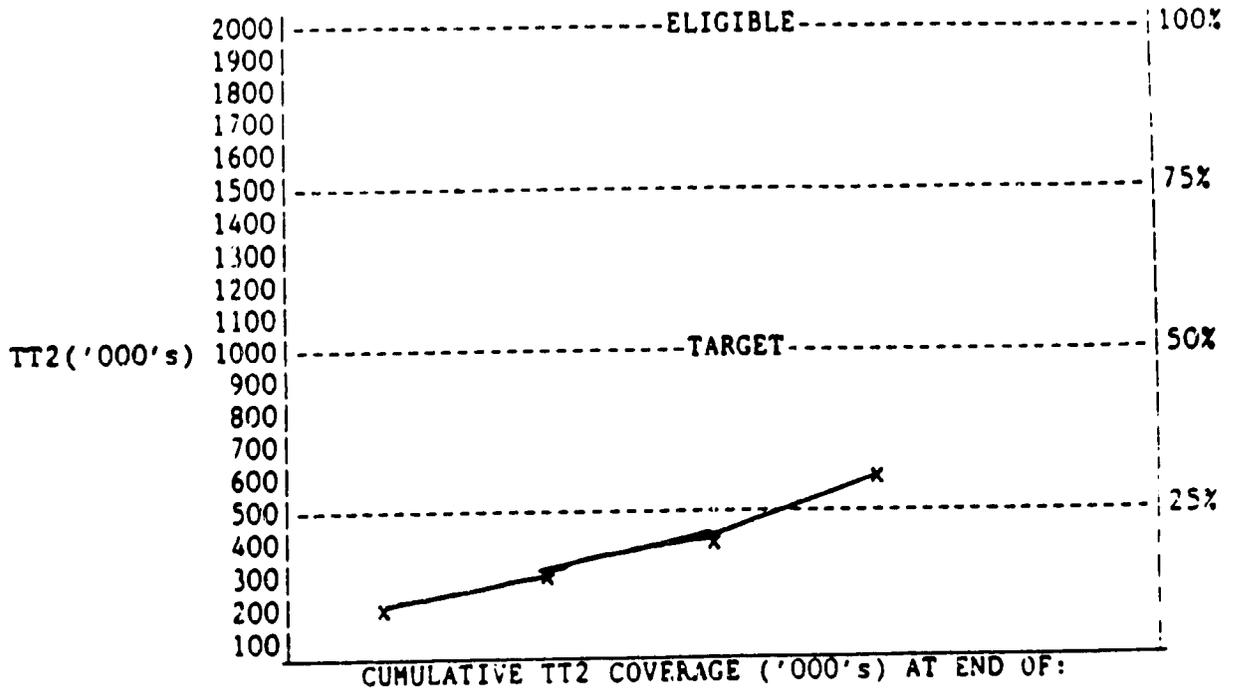
$$\frac{\text{pregnant women and women of childbearing age receiving TT2 during last 3 years} \times 100}{\text{total number of women of childbearing age}}$$

Figure 1 :

CUMULATIVE PERCENT OF FEMALE POPULATION COVERED WITH TT2

AREA: Fictitia
 TOTAL POPULATION (1987): 10,000,000

ELIGIBLE POPULATION (1987): 2,000,000
 TARGET POPULATION (1987): 1,000,000



No. TT2 during:	1984	1985	1986	1987	1988
	<u>225</u>	<u>315</u>	<u>430</u>	<u>600</u>	<u>---</u>
1982	70				
1983	75	75			
1984	80	80	80		
1985		160	160	160	
1986			190	190	
1987				250	

When setting targets for the coming year, it is also important to consider coverage over the past three years. An example of how this can be done for any administrative area is given in Table 4 for a country which began TT immunization in 1981 and whose use of TT has been expanding each year to include more districts. In 1987, there are 2,463,958 women eligible for TT2. A 50% target set for 1987 would mean that 1, 231,979 women are to receive TT2.

Another important use of routine reports for monitoring completion rates. UNICEF in 1987 estimated that one third of women drop out from the first to second dose of TT. The following indicators are used to monitor completion rates.

$$a) 1 - \frac{TT1-TT2}{TT1} \times 100$$

$$b) 1 - \frac{TT1-TT3}{TT1} \times 100$$

Recordkeeping poses a particular problem with TT. Antenatal or mothers' health cards are less useful for recording TT immunizations in those programs targeting women of childbearing age, since this target group includes women before the inception of any pregnancy or between pregnancies. Use of a child's growth chart or child's immunization card for recording maternal TT is not an option where women must be immunized before or during their first pregnancy. Also these cards are not retained for more than a few years.

TT protection cards encased in inexpensive transparent plastic envelopes are needed. An example recommended by WHO appears in Figure 2. They should have space for five doses of TT and include important cultural symbols (religious, fertility, good luck, etc.). Current reporting forms should include TT immunization by dose (TT1, TT2, TT3) and (TT booster) and by target group (pregnant women, other women of childbearing age, and others) to permit valid monitoring.

Table 4:

TARGET SETTING FOR TT2

Eligibles for and Coverage With TT2

(1) <u>Fiscal Year</u>	(2) <u>Female Population^b (15-44 years old)</u>	(3) <u>Cumulative TT2 for previous three years</u>	(4) <u>Eligibles (2)-(3)</u>	(5) <u>TT2 Performed During Current Year</u>	(6) <u>Coverage (5)/(4)</u>
1981 ^a	-	-	-	147097	
1982	-	-	-	246954	
1983	2549892	394051	2155841	340684	16%
1984	2827114	734735	2092379	348842	17%
1985	30999441	936480	2163481	358903	17%
1986	3276841	1048429	2228412	519549	23%
1987	3691272	1227314	2463958	-	-

^a First year TT was offered

^b Programme expanded year by year to include more districts

NOTE WELL: Assumptions:

- Average duration of protection from TT2 lasts three years.
- Number of unvaccinated 15 year olds entering and vaccinated and unvaccinated 44 year olds leaving the eligible age span are not considered.

FIGURE 2 :

(FRONT)

TETANUS PROTECTION CARD

FAMILY NAME _____
 FIRST NAME _____ YEAR OF BIRTH _____
 ADDRESS _____
 DISTRICT _____
 STATE _____

CHILDHOOD DPT/DT IMMUNIZATION

Number of Doses _____

No information _____

ADULT TETANUS TOXOID

DATE

DAY MONTH YEAR

1st DOSE	_____	_____	_____
2nd DOSE	_____	_____	_____
3rd DOSE	_____	_____	_____
4th DOSE	_____	_____	_____
5th DOSE	_____	_____	_____

If you did not receive immunization before, you need two doses of tetanus toxoid (with four weeks interval between) and one dose in any future pregnancy

(REVERSE)

RECOMMENDED IMMUNIZATION SCHEDULE
FOR YOUR CHILDREN

at birth	BCG and polio
at 6 weeks	DPT and polio
at 10 weeks	DPT and polio
at 14 weeks	DPT and polio
at 9 months	measles