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GUATEMALA

Trends in Health and Nutrition  
Central America Initiative Indicators

1980 to 1987

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GUATEMALA  
Trends in Health and Nutrition  
Central America Initiative Indicators  
1980 to 1987

I. Introduction

This report presents changes in health and nutrition in Guatemala over the past eight years, based on the indicators outlined in the CAI. Information for this analysis was collected in fall of 1988 from all key primary and secondary data sources including the MOH, PAHO/Guatemala, the regional office of UNICEF based in Guatemala, national surveys, the sentinel area system and other reports (see references in Annex A).

II. Trends in Infant Mortality

In Guatemala there are three primary sources of information on infant mortality: vital statistics, national surveys, and the sentinel surveillance system. Although estimates of IMR based on vital statistics are consistently lower than those reported by surveys due to under-reporting of deaths and births and problems with the reporting systems itself, until the mid-80's Guatemala was dependent on vital statistics information for an estimate of IMR. When survey and surveillance system data became available, the MOH and all donors including USAID adjusted their estimates to reflect this improved information.

Figure 1 below illustrates these adjustments in IMR to survey data. From 1981-82, both the MOH and PAHO reported low IMRs using data from vital statistics. During these same years USAID and UNICEF, aware of the probability of significant under-reporting, used higher estimates. Then in 1983 when the first national survey yielded an IMR much higher than expected, both the MOH and PAHO increased their estimates. The MOH increased to the AID/UNICEF level, while PAHO went much higher. AID and UNICEF did not adjust their estimates to the results of this 1983 survey. In 1986 however, when the national surveillance system reported more moderate rates, USAID and the MOH increased their rates for 1983-84 to this new estimate. AID has chosen to follow the trajectory set by this surveillance system in 1986, a choice reinforced by the results of the 1987 national survey which reported an IMR only

slightly higher than projections based on the 1986 surveillance system report. In the meantime, MOH estimates have again dropped and UNICEF is using data from a report by the Latin American Demographic Center (CELADE), reporting an estimate between those of the MOH and AID.

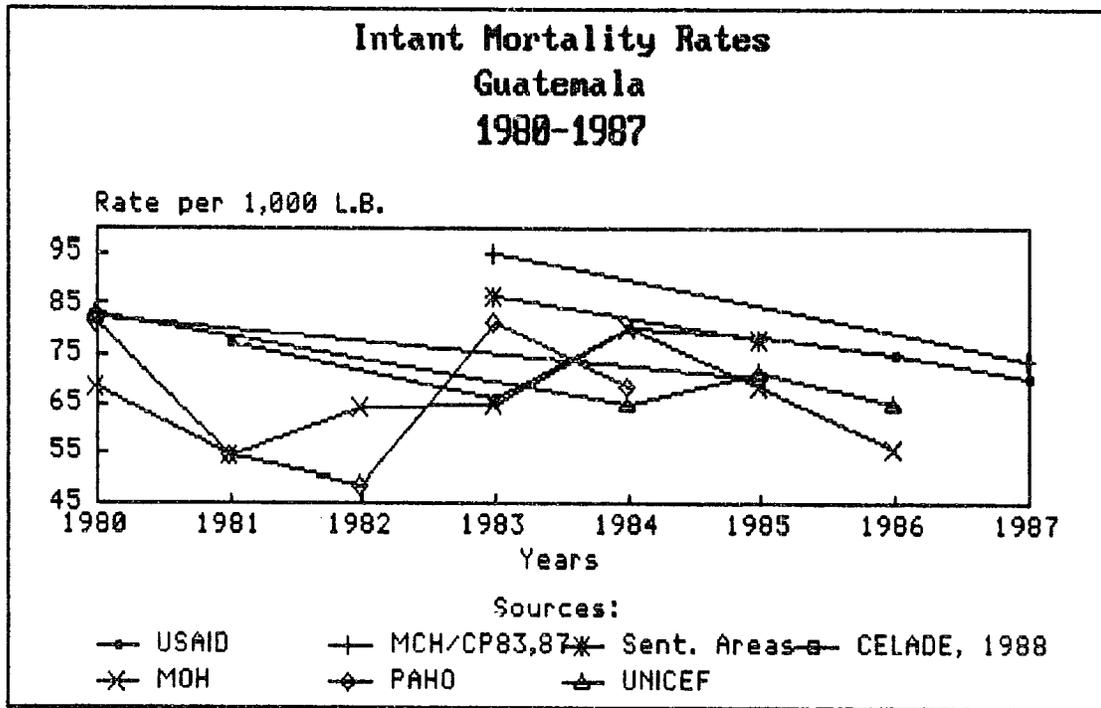
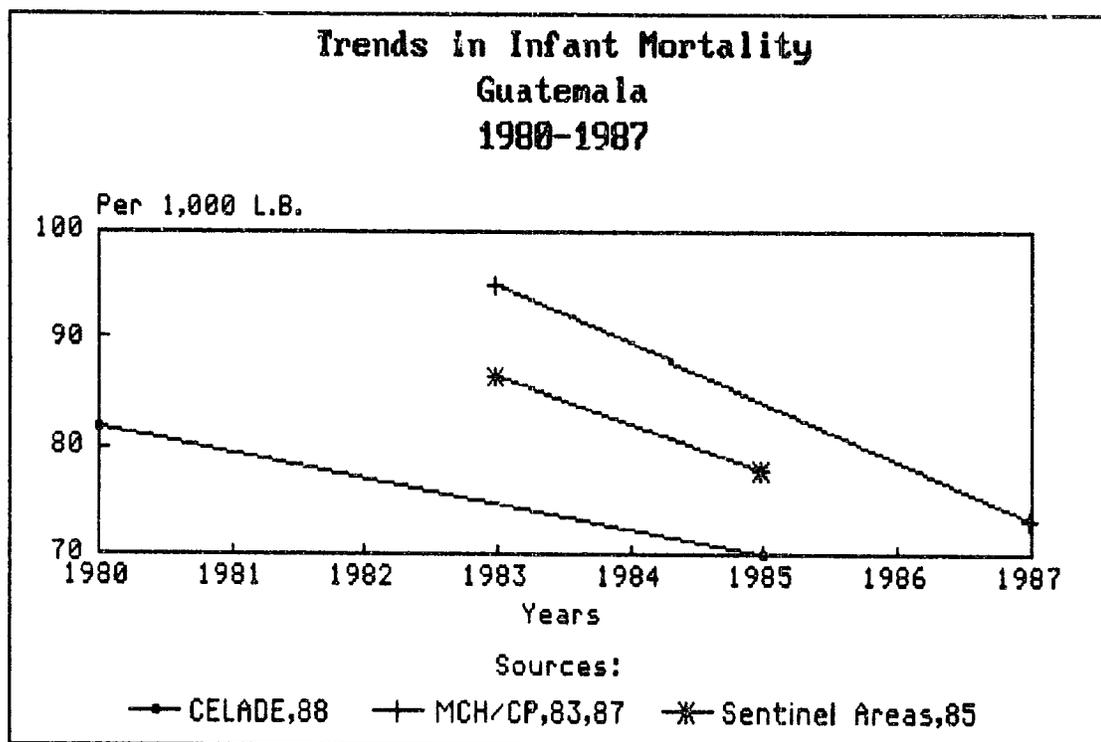


Figure 1

In order to clarify this picture, Figure 2 below presents a comparison of trends in IMR using only primary data sources. Although estimates vary, all sources agree that infant mortality rates have declined in Guatemala over the past eight years. When the best estimates for each year are used to indicate a trend for the entire eight year period, a short-term increase in IMR can be seen to have occurred from 1980 to 1983. This short-term increase is similar to those reported in El Salvador, Honduras and Costa Rica during the early 80's and corresponds to the height of the economic and socio-political crisis in the region. This report also found an increase in infant diarrhea-associated deaths during these same years (see diarrheal disease section).

Figure 2



### III. Measures of Vaccination Coverage

Data on vaccination coverage in Guatemala is available from both non-survey and survey sources. Non-survey sources include the MOH, PAHO and UNICEF, while survey sources include the Maternal-Child Health/Contraceptive Prevalence (MCH/CP) Surveys of 1983 and 1987, and Sentinel Area surveillance data from 1985.

Non-survey data is based on doses applied that year (the numerator) and population estimates from the most recent census (the denominator). This data is problematic as it is often based on inaccurate population estimates from an outdated census and does not take international migration into account, while the doses applied include only those given at public health facilities or during vaccination campaigns. The most valid information on coverage is provided by national surveys and surveillance. However in the 0-12 month group, changes in the definition of coverage over time make analysis of trends difficult; at least a part of the improvement in the coverage of infants reported in Guatemala from the 1987 survey is due to an adjustment of coverage to national norms.

### A. Coverage of Children 0-12 Months of Age

When discussing the vaccination coverage of infants it is important to keep in mind that coverage of this age group is not cumulative; it depends upon sustained annual efforts as each year more children are born who need attention. With a national growth rate near 3 percent, simply maintaining coverage of infants requires ever-increasing levels of effort.

Nonetheless, national survey data from 1983 to 1987 below shows an improvement in the vaccination coverage of Guatemalan infants in Polio 3, DPT 3 and BCG with a slight decrease in Measles coverage. All vaccines show a drop in coverage from 1983 to 1985, and an increase from 1985 to 1987.

Non-survey estimates for 1980-1987 in the graphs below also report the increase in BCG coverage, and agree with the 1985 drops in coverage and 1985-86 increases in coverage in both Polio 3 and DPT 3. However, with the exception of BCG, coverage estimates from this source are much higher than those reported by surveys and the overall trend results for most vaccines differ from survey data. According to these sources, from 1981 to 1986 Polio 3 and DPT 3 coverages fell while Measles coverage improved. The drop in estimates reported for 1985 by non-survey sources appears to be due to an adjustment to survey results rather than an actual drop in coverage.

Figure 3

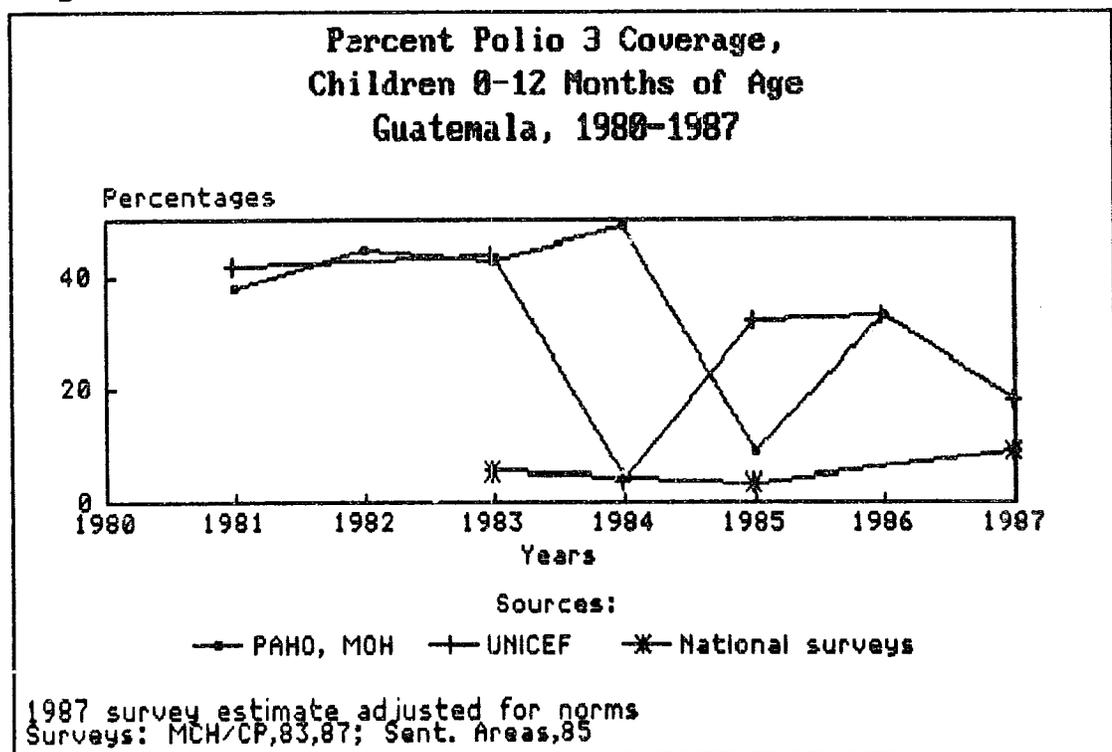


Figure 4

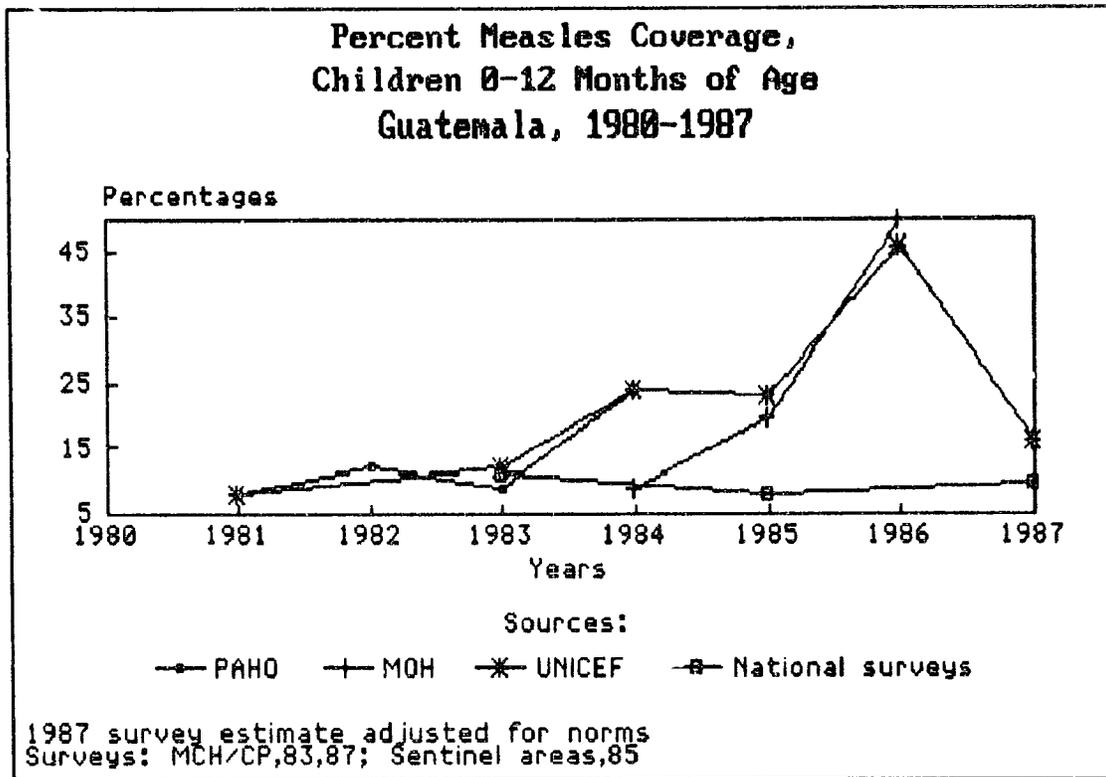


Figure 5

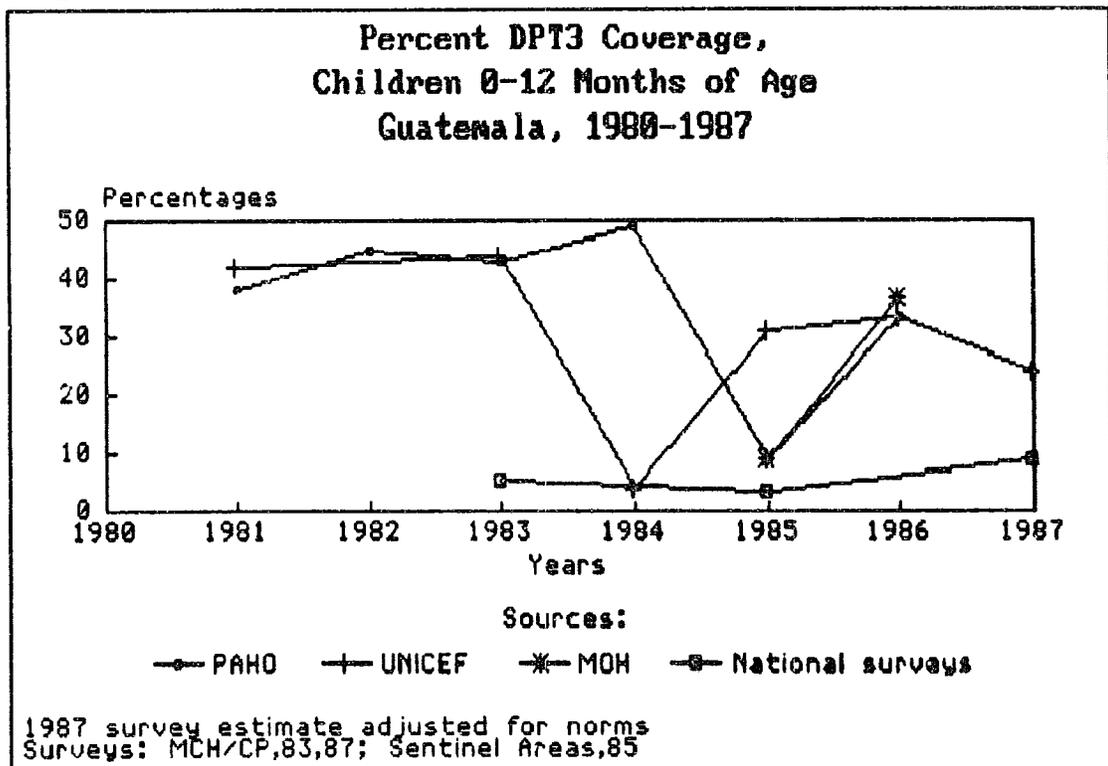
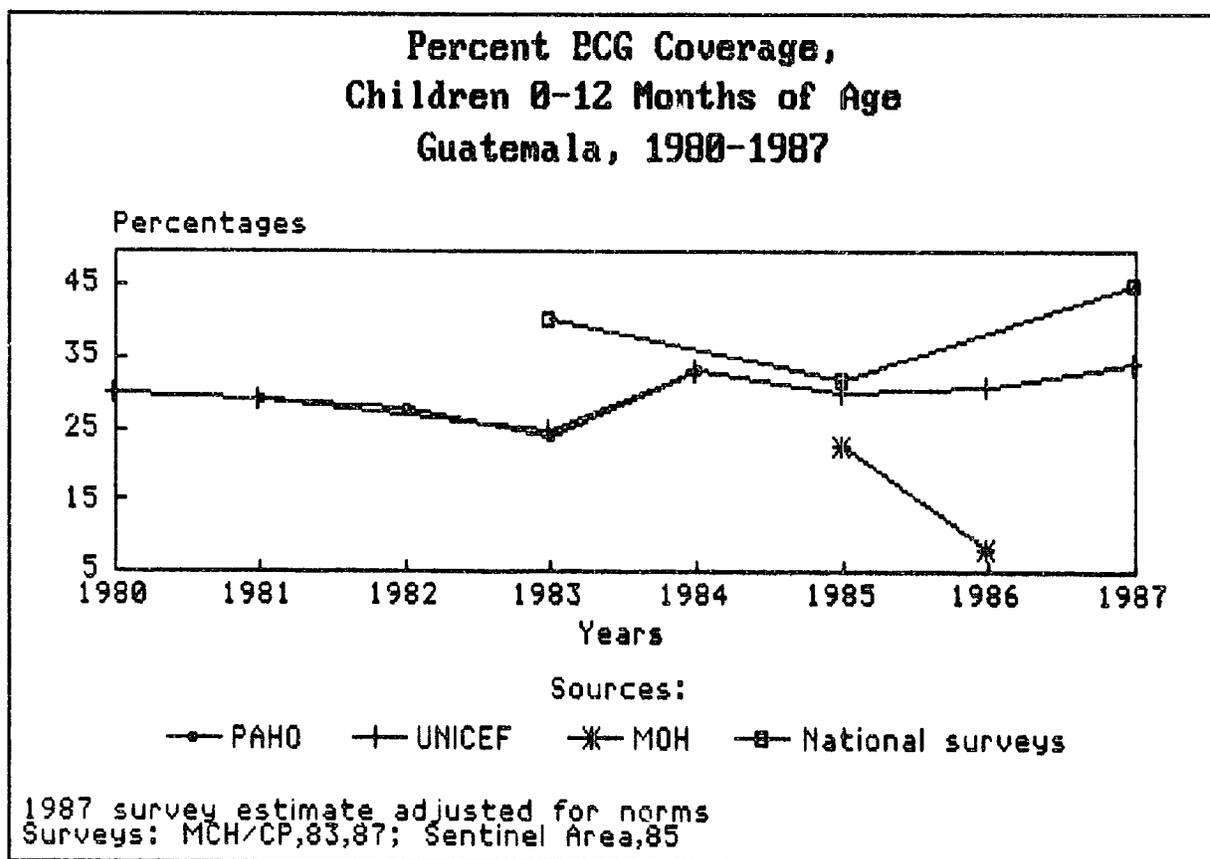


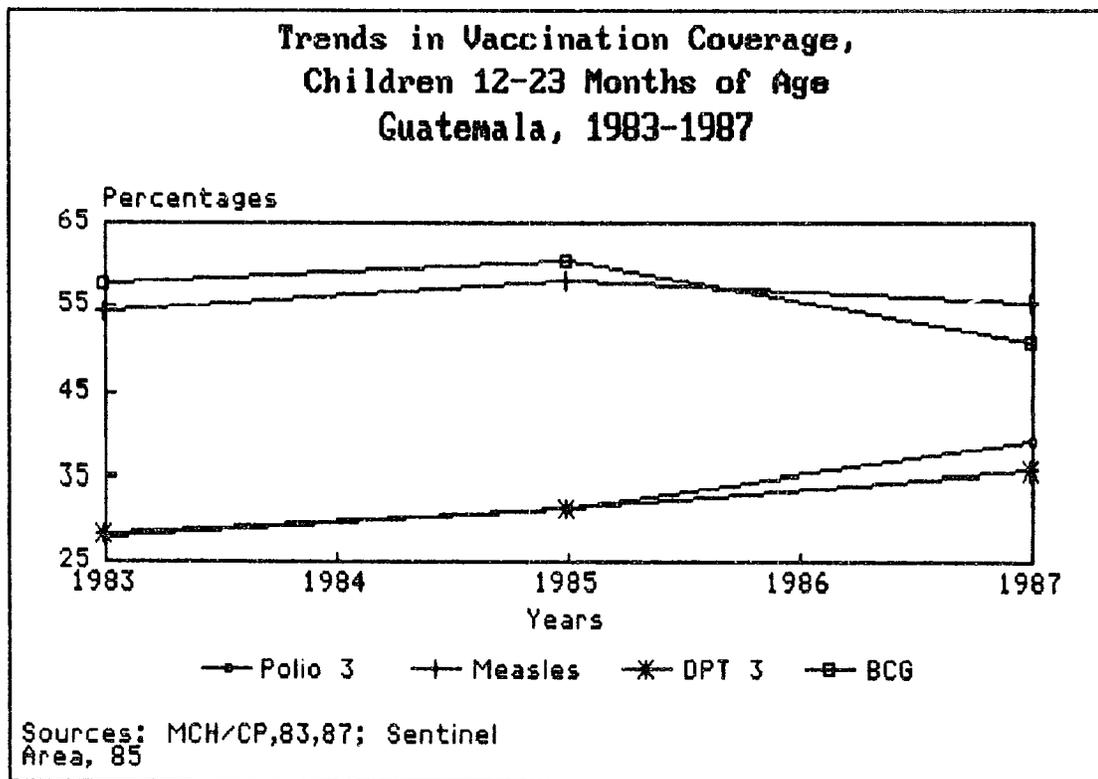
Figure 6



#### B. Coverage of Children 12-23 Months of Age

Unlike infant coverage discussed above, coverage estimates of the 12-23 month age group which are based on survey data reflect the cumulative effects of two years of vaccination efforts rather than one. The only source of information on coverage of Guatemalan children 12-23 months of age is from national surveys and the sentinel surveillance system. According to this data, presented below in Figure 7, from 1983 to 1987 coverages improved for Polio 3 and DPT 3, remained steady for Measles and declined for BCG. Although fluctuations in coverage over the 1983-86 period may be due to changes in data source, BCG and Measles coverages appear to have increased from 1983 to 1985 and decreased since then.

Figure 7



### C. Coverage of Pregnant Women with Tetanus Toxoid

There are three sources of data for this indicator: the MOH, national surveys and the sentinel system. The MOH data is service-based information on doses applied through the public health system (the numerator) and some estimate of the number of pregnant women in the population each year (using live births as a proxy measure)(the denominator). Surveys and surveillance systems, on the other hand, provided community-based data which captures TT received from other than the public health system, and uses real pregnancies as the denominator.

Unfortunately, the MCH/CP survey conducted in 1987 reports only pregnancies (over the previous five years) which received 1 or 2 doses of Tetanus Toxoid, while the MOH and surveillance systems report those receiving 2 doses separately. For this reason, the MCH/CP survey coverage shown in Figure 8 below is much higher than the other sources, while the surveillance system estimate is high but approximates the MOH estimate in 1985. Because of the differences in analysis of survey data, the only trend information is from the MOH which shows an increase in coverage from 1983 to 1985, with a sharp drop from 1985 to 1986. As with coverage of infants, immunization coverage of pregnant women is not cumulative; vaccination efforts must be renewed each year to meet the annual demand.

Figure 8

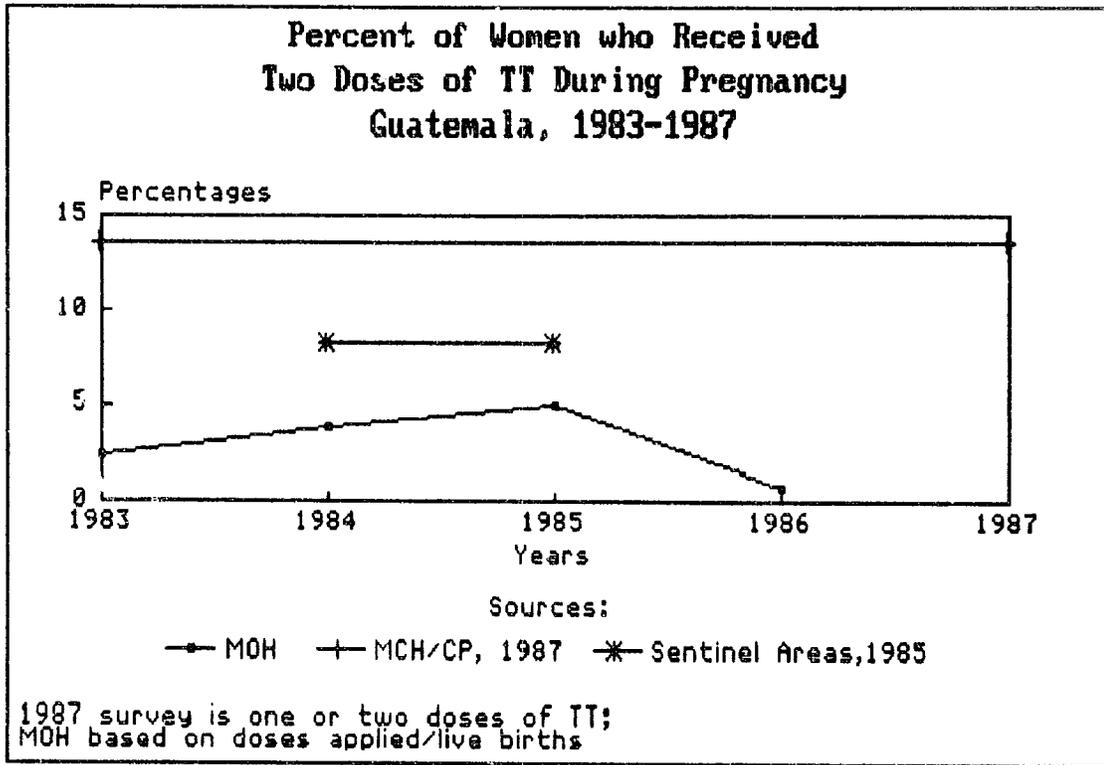
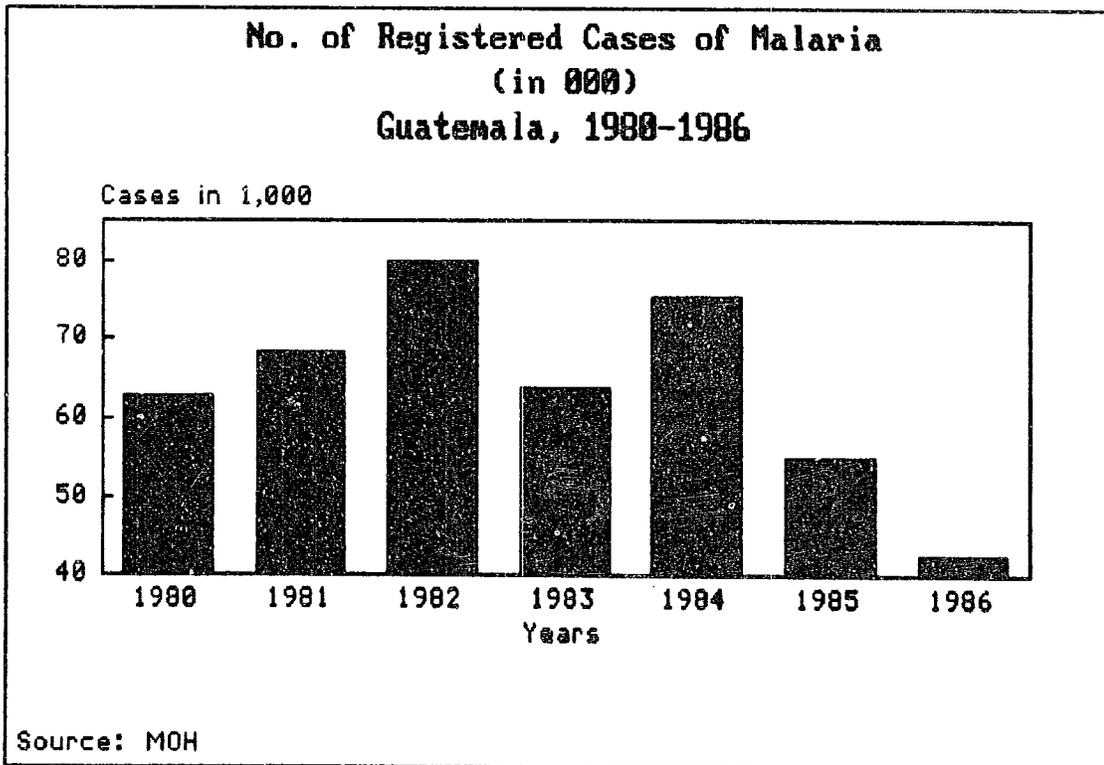


Figure 9



IV. Malaria

The MOH is the only source of information in Guatemala on malaria morbidity. Unfortunately, there is no survey data to validate malaria morbidity on the community level.

Figure 9 above illustrates changes in the reported incidence of malaria from 1980 to 1986. According to this source, morbidity from malaria decreased significantly over the seven-year period. However, fluctuations occurred during that time with an increase in morbidity from 1980-82 and 1983-84 and a steady decrease since 1984. No data is available for 1987.

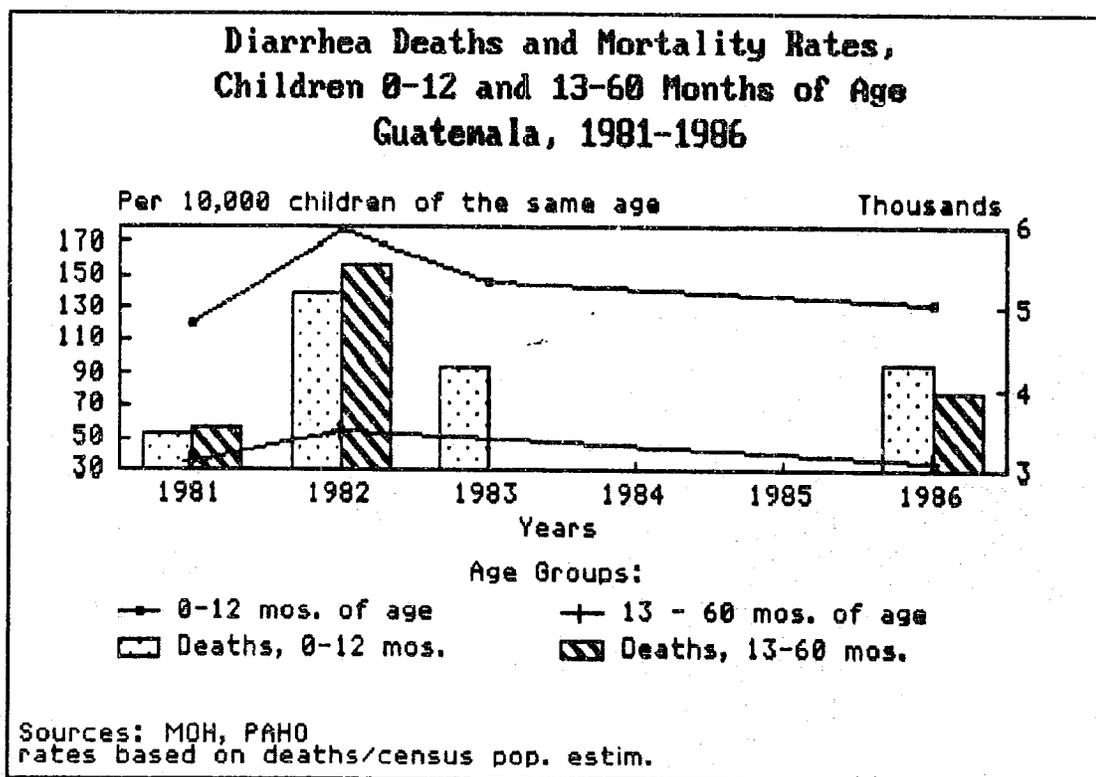
V. Diarrheal Disease

A. Diarrheal Disease Mortality among Children

Information on diarrhea-related deaths in Guatemala is available from vital statistics, reported by the Ministry of Health. As discussed earlier in this report, problems with under-reporting and the vital statistics system itself may result in significant under-estimates of deaths related to diarrhea which occur on the community level.

According to MOH data presented in Figure 10 below, from 1981 to 1987 there was an increase in the number of deaths from diarrhea

Figure 10

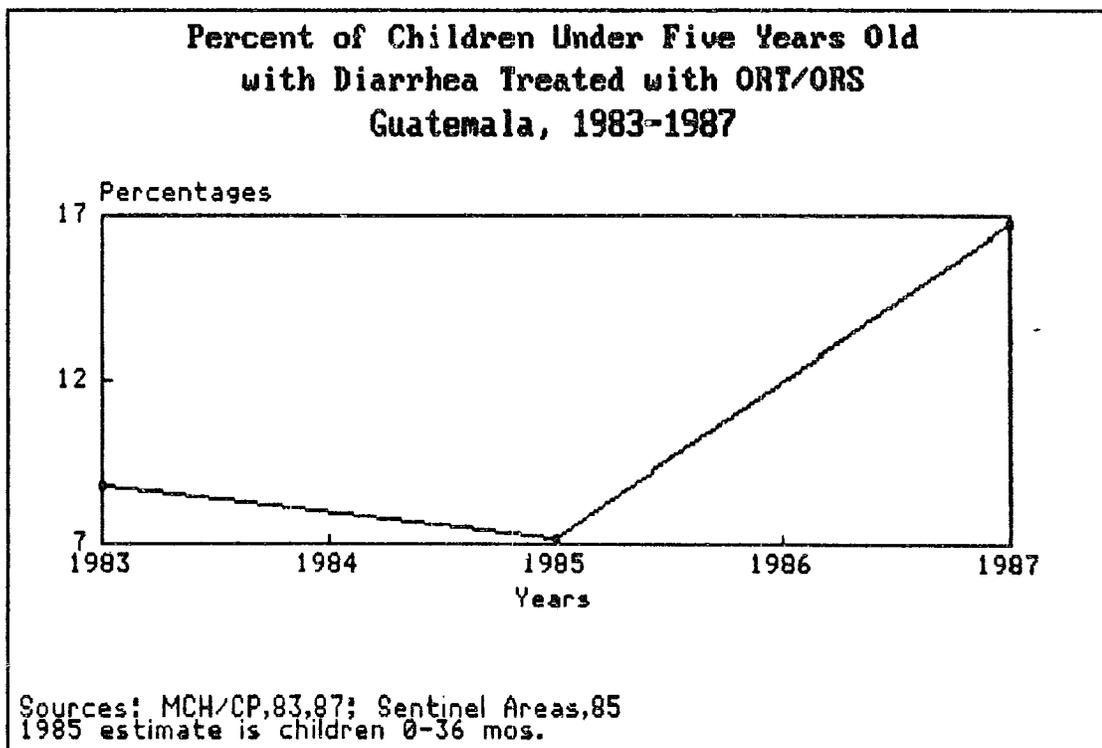


among children 13-60 months of age which translated into a slight decrease in mortality rates when population size taken into account. An increase also occurred over this time in diarrhea-related deaths among children 0-12 months, however in this instance mortality rates were also found to have increased. The increase in diarrhea mortality occurred particularly from 1981-82, though rates continued to be high through 1983. As diarrheal disease is the first cause of death among infants in Guatemala, it is interesting to note that these high rates in 1980-1983 correspond to the short-term increase in infant mortality rates from 1980-1983 discussed earlier in this report.

#### B. ORS/ORT Use Rates

Surveys and surveillance systems also provide also information on the use of ORS/ORT for prevention of dehydration during diarrhea episodes. According to survey data below in Figure 11, there has been an increase in the use of ORS/ORT during childhood diarrhea episodes in Guatemala since 1983. From 1983 to 1985 there appears to have been a decrease in rates, with a dramatic increase from 1985 to 1987. Although the differences in data source (survey/surveillance) may account for the drop in rates from 1983-85, a community KAP survey conducted in 1987 reported a use-rate of 7.7 percent which was similar to the 1985 rate.

Figure 11

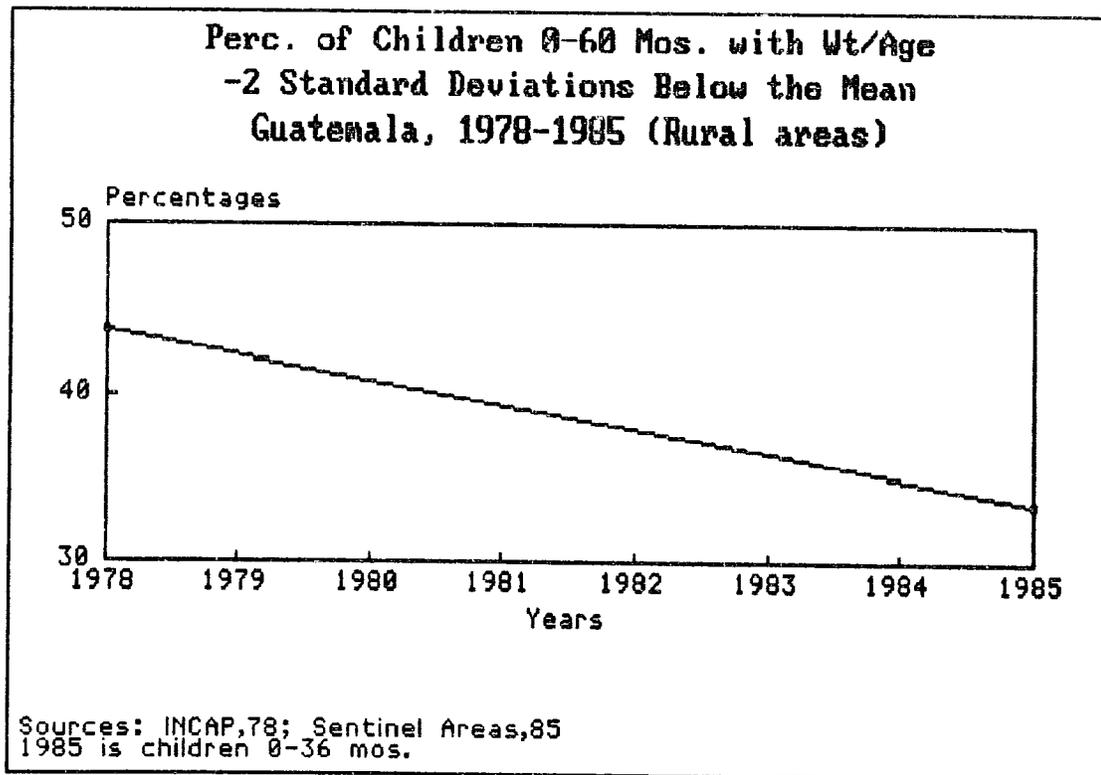


## VI. Childhood Undernutrition

The best information in childhood nutritional status in Guatemala is from national anthropometric surveys. In 1978 a national survey of this type collected data which was at first analyzed using the Gomez method of Grades of undernutrition. The Central American Nutrition Institute (INCAP) later re-analyzed the data from this survey into current state-of-the-art Z scores (standard deviations from the mean) using NCHS reference measures. In 1985, the sentinel surveillance system again collected anthropometric data which was analyzed using Z scores and NCHS reference measures.

Weight for age comparisons are considered to be a measure of overall nutritional status, combining the effects of wasting (weight for height) and stunting (height for age). A comparison of the results of the two national anthropometric surveys below, shows there to have been a decrease in the percent of rural children under five years of age with moderate or severe weight for age deficiencies from 1978 to 1985. Unfortunately, no information is available on fluctuations in nutritional status over this seven-year period.

Figure 12



## VII. Water and Sanitation

There are three sources of information on water and sanitation: WASH ( USAID's centrally-funded water and sanitation project), PAHO and UNICEF. Figures 13 through 16 below present a comparison of coverage estimates from these sources from 1980 to 1987.

According to WASH, rural water and sanitation coverages have improved while urban water and sanitation coverages have declined over the past six years. PAHO and UNICEF agree with the rural water and sanitation coverages and trends reported by WASH. However, urban water and sanitation coverages reported by UNICEF and PAHO are higher than those reported by WASH and show no change or some improvement since 1980.

Figure 13

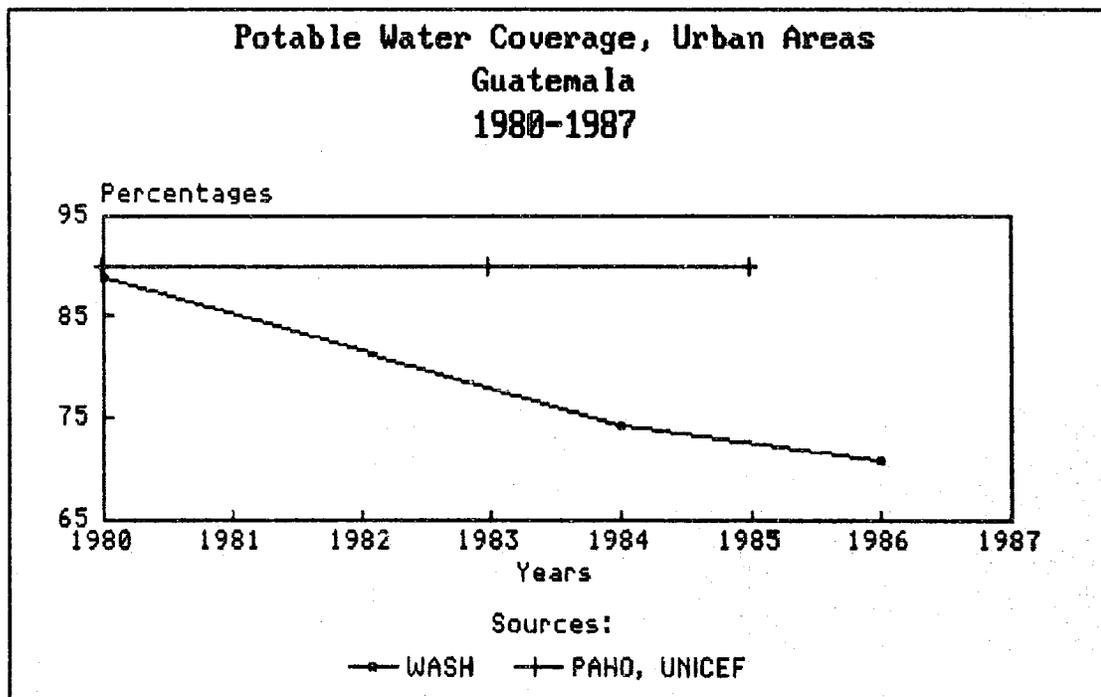


Figure 14

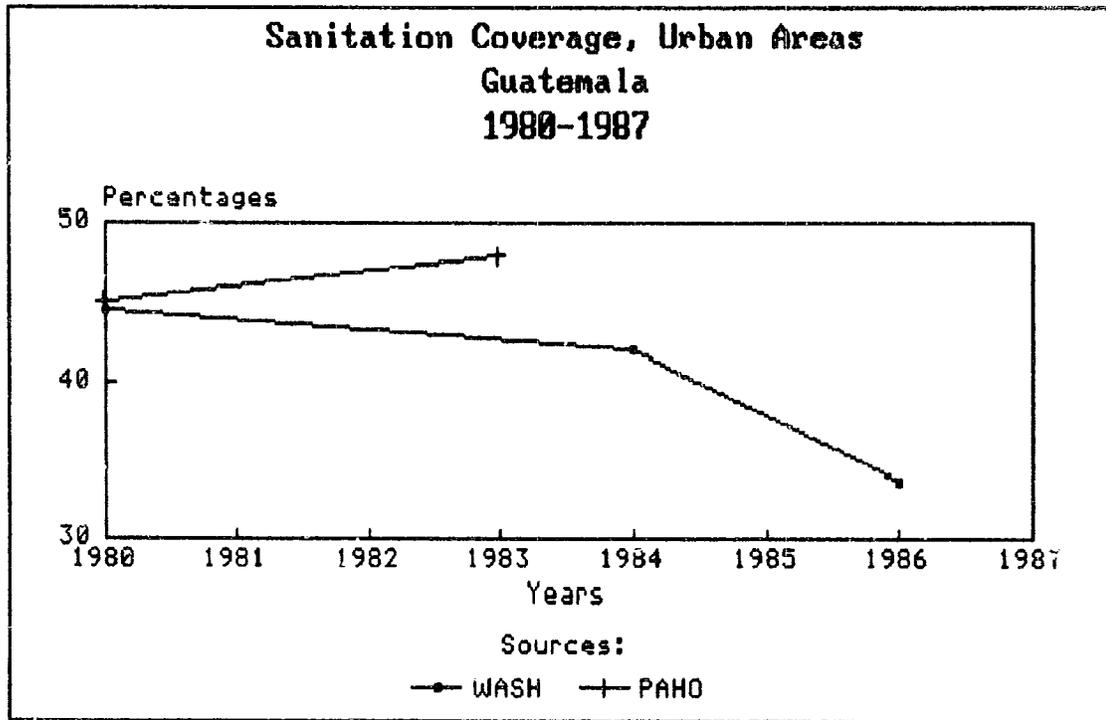


Figure 15

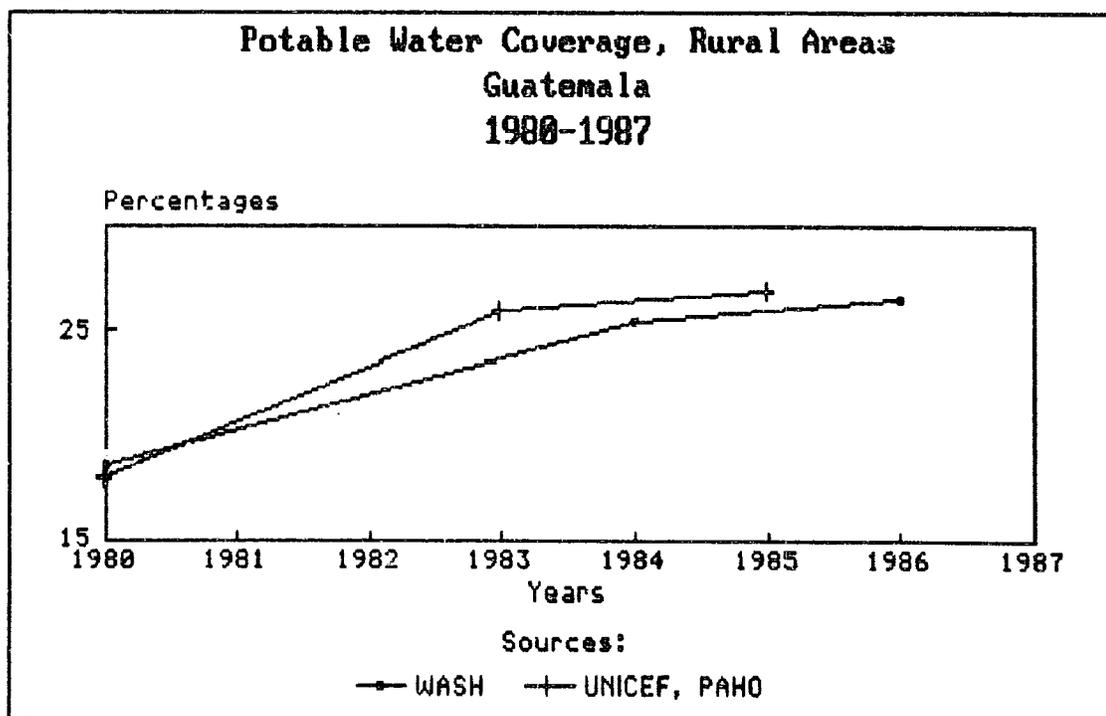
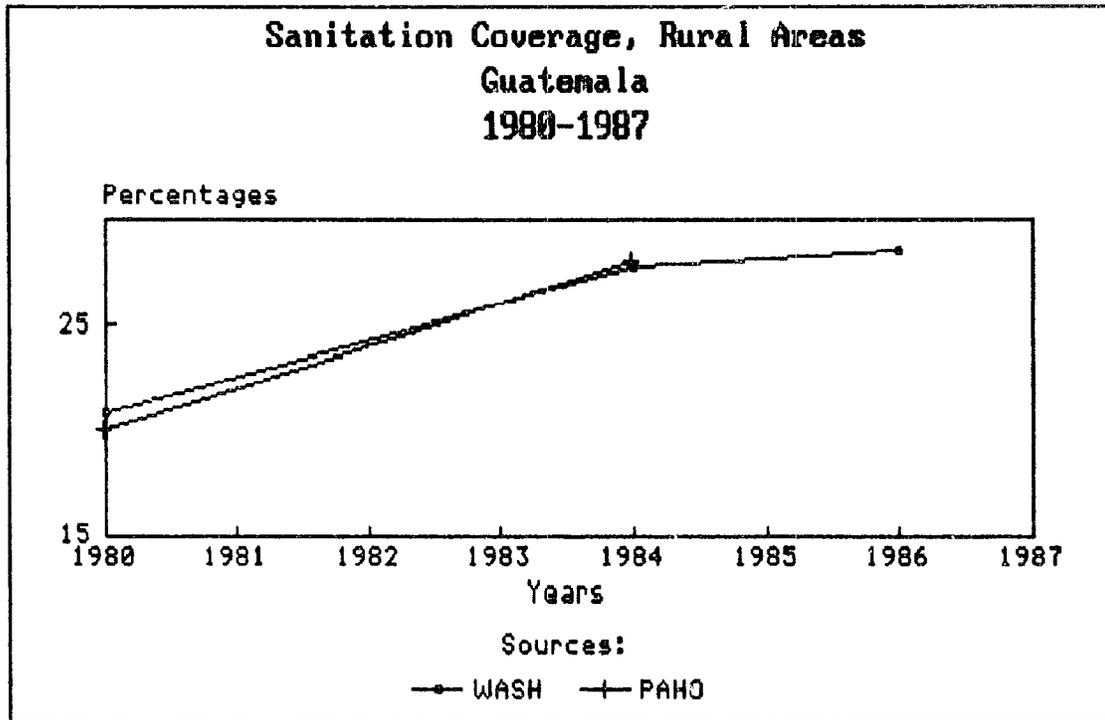


Figure 16



ANNEX A  
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ANNEK B  
Data from Guatemala



Table 2  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 0-12 mos. having received polio 3 vaccine

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA *								
	(0 - 60 mos of age)			(0 - 60 mos)**		7.8		
Ministry of Health	68.3	62.3	72.0	32.5	24.7	8.8 5.0	38.7	
<u>Surveys/other (list):</u>								
MCH/CP Survey - 1983				5.3				
Sentinel Areas - 1986						3.5		
Community KAP - 1987								(3-11mos) 22.9
MCH/CP Survey - 1987								(3-11mos) 9.0
PAHO		38.0	45.0	43.0	4.0 49.0	9.0	33.0	
UNICEF		42.0		44.0	4.0 46.0	(1985 - 86) 32.0 9.0	33.0	18.0

Notes:  
 \* Immunization data reported by the Mission as percent of 0-60 mos. old with complete series of all vaccines  
 \*\* Perc. based on doses applied (all 3 doses) and census population estimates

Table 3  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 0-12 mos. having received measles vaccine

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA *								
	(children 0 - 60 mos. of age)						11.0	
Ministry of Health	60.0	51.6	47.0	12.2**	9.1**	19.4 17.3	49.4	
<u>Surveys/other (list):</u>								
MCH/CP Survey - 1983				11.3				
Sentinel Areas - 1986						8.0		
Community KAP - 1987								(3-11mos) 3.0
MCH/CP Survey - 1987								(3-11mos) 9.9
PAHO		8.0	12.0	9.0	24.0	23.0	46.0	
						(1985 - 86) 42.0		
UNICEF		8.0		12.0	24.0	23.0	46.0	16.0

Notes:

\* Immunization data reported by the Mission as percent of 0-60 mos. olds with complete series of all vaccines

\*\* Perc. based on doses applied and census population estimates

Table 4  
Comparison of data sources on CAI core Health and Nutrition Indicators,  
1980-1987

Percent of children 0-12 mos. having received DPT 3 vaccine

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA *								
	(children 0 - 60 mos. of age)					8.0		
Ministry of Health	68.1	62.5	75.0	33.0**	24.5**	5.0 9.0	36.7	
<u>Surveys/other (list):</u>								
MCH/CP Survey - 1983				5.5				
Sentinel Areas - 1986						3.5		
Community KAP - 1987								(3-11mos) 15.9
MCH/CP Survey, 1987								(3-11mos) 9.0
PAHO		38.0	45.0	43.0	4.0 49.0	9.0	33.0	
UNICEF		42.0		44.0	4.0 47.0	(1985 - 86) 31.0	33.0	24.0

Notes:

\* Immunization reported by the Mission as percent of 0-60 mos. olds with complete series of all vaccines

\*\* Perc. based on doses applied (all 3 doses) and census population estimates

Table 5  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 0-12 mos. having received BCG vaccine

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA *								
	(children 0 - 60 mos. of age)						20.3	
Ministry of Health	43.0	35.7	43.0	18.0**	12.9**	41.0	22.8	8.0
<u>Surveys/other (list):</u>								
MCH/CP Survey - 1983				40.3				
Sentinel Areas - 1986						31.6		
Community KAP - 1987								(3-11mos) 26.3
MCH/cP Survey - 1987								(3-11mos) 45.0
PAHO		29.0	28.0	24.0	33.0			
						(1985 - 86)		
						30.0		
UNICEF	30.0	29.0		25.0	33.0	30.0	31.0	34.0

Notes:

\* Immunization data is reported by the Mission as percent of 0-60 mos. olds with complete series of all vaccines

\*\* Percentages based on doses applies and census population estimates

Table 6  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 12--23 mos. having received polio 3 vaccine

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA *								
	(children 0 - 60 mos. of age)					(12 - 60 mos)		
Ministry of Health	68.3	62.3	72.0	32.5**	24.7**	6.4	43.9	
<u>Surveys/other (list):</u>								
MCH/CP Survey - 1983				28.0				
Sentinel Areas - 1986						31.5		
Community KAP - 1987								66.2
MCH/CP Survey - 1987								39.3
PAHO						(12-60mos)		
						42.7		
UNICEF								

Notes:

\* Immunization data reported by the Mission as percent of 0-60 mos. olds with complete series of all vaccines

\*\* Perc. based on doses applies (all 3 doses) and census population estimates

Table 7  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 12-23 mos. having received measles vaccine

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA *								
Ministry of Health	(children 0 - 60 mos. of age)				(12-60mos)(<60mos)			
	60.0	51.6	47.0	12.2**	9.1**	6.5	35.3	
<u>Surveys/other (list):</u>								
MCH/CP Survey - 1983				54.4				
Sentinel Areas - 1986						58.2		
Community KAP - 1987								70.6
MCH/CP Survey - 1987								55.3
PAHO							(12-60mos) 33.0	
UNICEF								

Notes:

\* Immunization data reported by the Mission as percent of 0-60 mos. olds with complete series of all vaccines

\*\* Perc. based on doses applied and census population estimates

Table 8  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 12-23 mos. having received DPT 3 vaccine

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA *								
	(children 0 - 60 mos. of age)					(12 - 60 mos)		
Ministry of Health	68.1	62.5	75.0	33.0**	24/5**	7.0	32.7	
<u>Surveys/other (list):</u>								
MCH/CP Survey - 1983				28.3				
Sentinel Areas - 1986						31.3		
Community KAP - 1987								65.8
MCH/CP Survey - 1987								35.9
PAHO						(12-60mos)		
							36.4	
UNICEF								

Notes:

\* Immunization data reported by the Mission as percent of 0-60 mos. olds with complete series of all vaccines

\*\* Perc. based on doses applies (all 3 doses) and census population estimates

Table 9  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 12-23 mos. having received BCG vaccine

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA *								
Ministry of Health	(children 0 - 60 mos. of age)					(12 - 60 mos)		
	43.4	35.7	43.0	18.0**	12.9**	3.4	0.8	
<u>Surveys/other (list):</u>								
MCH/CP Survey - 1983				57.6				
Sentinel Areas - 1986						60.5		
Community KAP - 1987								51.3
MCH/CP Survey - 1987								50.7
PAHO								
UNICEF								

Notes:

\* Immunization data is reported by the Mission as percent of 0-60 mos. olds with complete series of all vaccines

\*\* Perc. based on doses applies and census population estimates

Table 10  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of women 15-49 yrs. who have delivered in the last 12 mos.  
 who have received two doses of tetanus toxoid

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA							0.4*	
Ministry of Health				2.3**	3.8**	5.0**	0.7**	
<u>Surveys/other (list):</u>								
Sentinel Areas - 1986						8.2*		
MCH/CP survey - 1987							13.6***	
PAHO								
UNICEF								

Notes:  
 \* Pregnant women  
 \*\* Perc. based on doses applied to pregnant women, and total live births  
 \*\*\* Women delivered in the past five years who had one or two doses of TT

Table 11  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987

Number of registered cases of malaria

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA								
Ministry of Health	62656	67994	80070	64024	75367	54958	42609	
<u>Surveys/other (list):</u>								
PAHO								
UNICEF								

Notes:

Table 12  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Diarrhea-assoc. mortality rate in children 0-12 mos. of age  
 (per 10,000 children 0-12 mos.)

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA								
deaths			(5190)	(4285)			(4331)	
Ministry of Health*			177.7	146.7			132.2	
<u>Surveys/other (list):</u>								
deaths	(1970)	(3440)						
PAHO	1817.8**	1128.0**						
		121.1*						
UNICEF								

Notes:

\* Rates based on no. of deaths and census population estimates

\*\* Per 100,000 population or live births?

Table 13  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987

Diarrhea-assoc. mortality rate in children 13-60 mos. of age  
 (per 10,000 children 13-60 mos.)

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA								
deaths			(5535)	(<60mos)			(3970)	
Ministry of Health *			54.2	72.2			34.8	
<u>Surveys/other (list):</u>								
deaths	(1970)	(3513)						
PAHO	807.6**	370.2**						
		35.3*						
UNICEF								

Notes:

\* Rates based on no. of deaths and census population estimates

\*\* Per 100,000 children 13-60 months of age

Table 14  
 Comparison of data sources on GAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 0-59 mos. with diarrhea in the past 2 weeks  
 who were treated with ORT

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA						3.5*	3.5*	
Ministry of Health								
Surveys/other (list):								
MCH/CP Survey - 1983				8.8**				
Sentinel Areas - 1986						(<36mos) 7.2***		
Community KAP - 1987								7.7****
MCH/CP Survey - 1987								16.7
PAHO								
UNICEF								

Notes:

\* Cases of diarrhea treated with ORT

\*\* 7.4% ORS and 1.4% ORT

\*\*\* 3.5% ORS and 3.7% ORT

\*\*\*\* Children with diarrhea who were treated with ORT (7.1% ORS, 1.6% ORT)

Table 15  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 12-23 mos. with weight for age less than  
 2 standard deviations below the mean

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA								
Ministry of Health								
Surveys/other (list):								
Sentinel Areas - 1986						(<36mos) 33.6*		
INCAP - 1985	(1978) (<60mos) 43.6*					56.0		
PAHO								
UNICEF								

Notes:

\* Rural areas only

Table 16  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children 12-23 mos. with weight for age Grades II and III

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA								
Ministry of Health								
<u>Surveys/other (list):</u>								
PAHO								
UNICEF								(3-36mos) 33.5*

Notes:  
 \* Grades I, II and III

Table 17  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987

Percent of children under 60 mos. with a weight for age less than  
 2 standard deviations below the mean

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA								
Ministry of Health								
<u>Surveys/other (list):</u>								
INCAP - 1985	(1978) 43.6*							
Sentinel Areas - 1986						(<36 mos) 33.6*		
PAHO								
UNICEF								

Notes:

\* Rural only

Table 18  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of children under 60 mos. with weight for age Grades II and III

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA								
Ministry of Health								
<u>Surveys/other (list):</u>								
INCAP - 1985	(1978) 29.2*							
PAHO	(1977) 29.5							
UNICEF						76.0**		

Notes:  
 \*\* Grades I, II and III  
 \*Rural areas

Table 19  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987

Percent of urban population with access to potable water

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA	45.0*							
Ministry of Health								
<u>Surveys/other (list):</u>								
WASH - 1987	88.9				74.2		70.6	
PAHO	90.0			90.0				
					(1983 - 1986)			
						90.0		
UNICEF	89.0					90.0		

Notes:

\* Urban and rural



Table 21  
 Comparison of data sources on CAI core Health and Nutrition Indicators,  
 1980-1987  
 Percent of urban population with adequate sanitation

Country: GUATEMALA

Source	1980	1981	1982	1983	1984	1985	1986	1987
USAID/GUA								
Ministry of Health								
<u>Surveys/other (list):</u>								
WASH - 1987	44.4				41.9		33.7	
PAHO	45.0			48.0				
UNICEF								

Notes:

