

USE OF MATERNAL AND CHILD HEALTH SERVICES AND IMMUNIZATION COVERAGE IN PANAMA¹

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Panama is the first Latin American country where immunization data were collected during a national family planning and maternal-child health survey. This article presents some of the maternal-child health and immunization results that demonstrate the usefulness of the information obtained.

Introduction

In 1979 a family planning and maternal-child health (FP/MCH) survey was conducted in Panama by the Population Studies Office of Panama's Ministry of Health, with technical assistance from the Family Planning Evaluation Division of the U.S. Centers for Disease Control (1). This type of survey, conducted in several Latin American countries, has been useful in providing demographic and program data for the evaluation of family planning programs (2). In addition to other types of information, the Panama survey also collected data on the immunization status of all children under six years of age—making Panama the only country in the Americas besides the United States that is known to have conducted a national immunization survey.

This article presents results of the Panama survey regarding mothers' use of maternal

and child health services and their children's immunization status. On the average, the questionnaire used in the aforementioned Latin American FP/MCH surveys has required 25 minutes of interview time to complete. The addition of an immunization module to the standard household form in the Panama survey increased the total interview time by three to four minutes. A principal aim of the present article is to demonstrate the usefulness of the various kinds of information collected as part of this national household survey.

In Panama, as in many Latin American countries, health services are provided by the Ministry of Health, the Social Security Institute, and private institutions. The overall maternal and child care program is considered to include care of women during pregnancy, medical care during delivery, a postpartum checkup, and well-baby care. Besides the foregoing institutional care, some measure of health care is provided by traditional midwives who lack formal academic preparation.

Panama's immunization program functions as a routine service, with no mass campaigns. The vaccines commonly recommended for children under six years of age are tuberculosis (BCG); diphtheria, pertussis, and tetanus (DPT); poliomyelitis, and measles vaccines. The official recommendations on vaccination are contained in an immunization manual developed jointly by the Ministry of Health and the Social Security Institute. The last revised edition was published in 1980 (3). Table 1 summarizes the immunization schedule recommended in this manual, which is similar to

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Table 1. Panama's scheme of immunization, as indicated in the 1980 immunization manual (3).

Vaccine	Primary immunization			
	No. of doses	Age at first dose	Interval	First booster
BCG	1	Newborn	—	When child enters school
Polio	3	2 months	Every 2 mos.	1 yr. after first dose
DPT	3	2 months	Every 2 mos.	1 yr. after first dose
Measles	1	9 months	—	At 15 mos. of age ^a

^aRecommended if vaccine was given during the first year of life.

that recommended by the World Health Organization (4).

Methodology

The survey design included two strata, urban and rural. A total of 1,636 and 1,478 households, respectively, were included in these strata, bringing the total number of households in the survey sample to 3,114. The 1976 World Fertility Survey was used as the sampling frame with appropriate updating of household listings (5). Although fertility data were collected on all women 15-44 years of age living in the sample households, the main body of the questionnaire was administered to one woman selected with equal probability from all women 15-44 living in each household. In addition, the household form of the questionnaire included questions on immunization, which were asked about all children under six years of age living in the sample households. Interviews were completed with 2,348 women (93 per cent of the total number of possible respondents). Information was also collected on the immunization status of 2,399 children under six years of age.

Results

Maternal and Child Health Services

All women in the sample, whether married or living in consensual union, who had had at least one live birth, were asked about the use of MCH services during their last pregnancy. Many said they received prenatal care during

their last pregnancy (80 per cent), delivered in a medical facility (84 per cent), received a postpartum checkup during the first month after delivery (67 per cent), and obtained well-baby care for their newborn children (89 per cent) (Table 2). The figure for postpartum checkups may be artificially low compared to the others, because women who had checkups after the first month of puerperium were not included.

Health ministry hospitals, health centers, and health posts were the main sources of MCH care. As Table 3 shows, the percentages of rural women using these health ministry facilities for prenatal care (81 per cent) and well-baby care (89 per cent) were far higher than the percentages of urban women using these facilities (45 and 57 per cent, respectively). Conversely, far more urban women were using facilities of the Social Security Institute and private clinics.

There was no significant difference between the percentages of rural and urban women using health ministry facilities for childbirth. It is interesting to note that most rural women who did not go to such a facility for delivery used the services of a midwife (20 per cent); while most urban women who did not go to a health ministry facility for delivery went to a Social Security Institute hospital or clinic (15 per cent), or else to a private hospital or clinic (13 per cent). This means that many rural women who received prenatal care at a health ministry clinic went to a midwife for help with delivery, probably because most hospitals are located in urban areas far from rural homes and because the rural health centers and posts generally lack facilities for delivery.

Table 2. Survey mothers' use of medical facilities for various types of MCH care during their last pregnancy. The group studied included 1,413 women 15-44 years old, married or living in consensual union at the time of the survey, who had had at least one live birth.

Use of medical facilities ^a	% receiving indicated type of MCH care			
	Prenatal	Childbirth	Postpartum ^b	Well-baby
Yes	80.2	84.2	66.6	88.8
No	19.4	14.8	33.0	10.6
Unknown	0.4	1.0	0.3	0.6
Total	100.0	100.0	100.0	100.0

^aIncluding health ministry, social security, and private facilities.

^bOnly during the first month after delivery.

Table 3. Sources of prenatal, childbirth, and well-baby care used by urban and rural survey mothers^a 15-44 years old.

Source of service	% receiving indicated type of MCH care					
	Prenatal		Childbirth		Well-baby	
	Urban mothers	Rural mothers	Urban mothers	Rural mothers	Urban mothers	Rural mothers
Health ministry hospital	6.3	14.6	61.9	59.1	9.6	20.6
Health ministry center/post	38.9	66.5	4.8	9.9	47.4	68.2
(Health ministry subtotal)	(45.2)	(81.1)	(66.7)	(69.0)	(57.0)	(88.8)
Private physician or clinic	30.4	7.3	13.1	1.4	21.9	2.8
Social Security Institute	22.4	9.4	14.6	5.0	19.6	7.5
Midwife	—	—	3.2	20.4	—	—
Other	1.9	0.2	2.2	2.3	1.5	1.0
Unknown	0.1	2.2	0.2	1.8	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0
No. of cases (unweighted)	(674)	(484)	(763)	(650)	(719)	(551)

^aWomen married or living in consensual union at the time of the survey who had had at least one live birth

At the same time, even though urban women were more likely than rural women to use the social security and private institutions, many urban women who went to these institutions for prenatal care went to health ministry hospitals for delivery. This was probably due to economic considerations (because delivery care is more expensive than prenatal care) or to lack of social security or private delivery facilities at some urban locations.

The survey did not investigate the number of prenatal visits made during pregnancy, but

it did record the month of pregnancy in which the women received their first prenatal care. Most women (73 per cent) started receiving prenatal care during the first trimester of pregnancy, and an even higher share (83 per cent) of those attending private and social security facilities started receiving care in the first trimester (Table 4). Only 2 per cent of the women received their first prenatal care during the third trimester of pregnancy.

Sixty per cent of the women received all three types of outpatient MCH services (pre-

Table 4. Trimester when prenatal care began, by source of care, for the 1,158 survey mothers 15-44 years old who reported receiving prenatal care during their last pregnancy (see Table 3).

Months of gestation at time of first prenatal care	All mothers receiving prenatal care	Sources of prenatal care				
		Health ministry hospital	Health ministry center/post	Private physician or clinic	Social Security Institute	Other
≤ 3 months	72.7	70.5	66.7	83.1	82.9	61.5
4-6 months	23.8	26.3	29.3	13.8	15.8	23.1
7-9 months	2.2	0.8	2.9	2.4	0.8	0.0
Doesn't remember	1.4	2.3	1.1	0.8	0.6	15.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
No. of cases (unweighted)	(1,158)	(110)	(585)	(231)	(205)	(27)

natal, postpartum, and well-baby care) (Table 5); only 7 per cent did not receive any of these services. The percentages using the three services were higher for urban women, for women with higher levels of education and income, for women currently working, and for those who had their last delivery of a live infant at a medical facility, especially a private hospital or clinic.

Besides those using all three services or no services, a third of the women surveyed used one or two of the three MCH outpatient services. These women had visited a medical facility at least once in connection with their last pregnancy, and there had been an opportunity at that time to make them more aware of the importance of using all three MCH services.

It was also found that the tendency to use all three outpatient services was higher in the middle age groups (25-29 years and 30-34 years), and lower in both the younger and older age groups (Figure 1). Mothers with one or two living children were most apt to have used all three MCH services (Figure 2). According to these data, Panamanian women who are multiparous or whose age places them at one extreme or the other of reproductive life are less likely than others to use all three MCH services, even though such women run a higher risk that their pregnancy will have an adverse outcome.

Sixty-one per cent of the sample's married

Table 5. Percentages of 1,413 survey mothers 15-44 years old (married or living in consensual union) who used no MCH services or all three types of MCH services (postpartum, childbirth, and well-baby care) during their last pregnancy, by selected characteristics.

Selected characteristics of survey mothers	% of mothers using all three services	% of mothers not using any service
<i>Area of residence:</i>		
Urban	68.4	2.8
Rural	52.5	9.0
<i>Education:</i>		
<Primary complete	47.3	11.9
Primary complete	54.3	6.7
>Primary complete	75.0	0.8
<i>Monthly family income:</i>		
First quartile	45.6	11.6
Second quartile	62.2	2.5
Third quartile	67.1	4.2
Fourth quartile	74.5	2.9
<i>Employment status:</i>		
Currently working	73.2	3.4
Not working	55.5	6.9
<i>Source of care at last live delivery:</i>		
Private hospital or clinic	83.0	1.0
Social Security Institute facility	70.7	0.8
Health Ministry hospital or center	63.8	2.3
Other	43.9	23.8
Midwife	22.9	30.2
Total (N = 1,413)	59.8	6.8

women 15 to 44 years of age were using a contraceptive method at the time of the survey. (1). Women who received MCH care during their last pregnancy were found more likely to

Figure 1. Women using all three types of MCH services, by age group. The survey sample included all women 15-44 years old who were married or living in a consensual union at the time of the 1979 survey, and who had had at least one live birth.

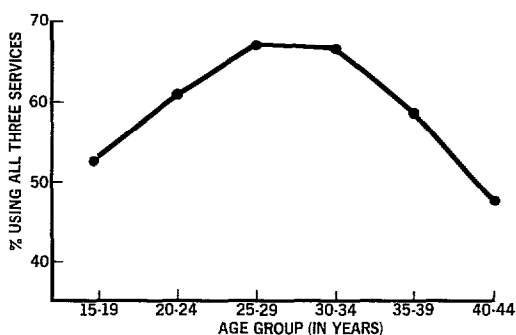
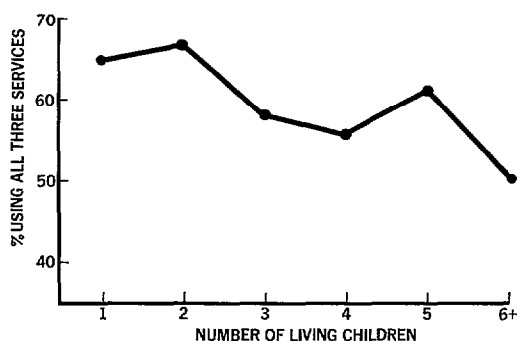


Figure 2. Women using all three types of MCH services, by number of living children. The survey sample included all women 15-44 years old who were married or living in a consensual union at the time of the survey, and who had had at least one live birth.



use a contraceptive method, and this was especially true of those who received all three outpatient services. In all, 75 per cent of those who received all three services were using a contraceptive method, as compared to 23 per cent of those who received no services (Table 6). This implies that factors affecting the use of MCH services may also affect the use of family planning services.

Table 6. The percentages of survey mothers married or living in consensual union who were practicing contraception at the time of the survey, by type of MCH care received during the last pregnancy. (The 936 respondents were 15-44 years old and had had at least one live birth.)

Types of MCH services received	No. of women (unweighted)	% currently using contraception
None	45	22.9
Prenatal only	21	— ^a
Postpartum only	3	— ^a
Well-baby only	45	44.2
Prenatal + postpartum only	10	— ^a
Postpartum + well-baby only	41	52.2
Prenatal + well-baby only	123	55.8
All services	648	74.7

^aNo percentage is given because the total number of women was less than 25.

Immunization

The survey revealed that almost all children who had received primary immunization were vaccinated by age two (Figure 3). As Table 7 indicates, most children one to five years of age had received complete primary immunization with BCG, poliomyelitis, DPT, and measles vaccines. The percentages were higher for urban than for rural children. They also

Figure 3. Percentages of survey children under six years of age receiving complete primary BCG, poliomyelitis, DPT, and measles immunizations.

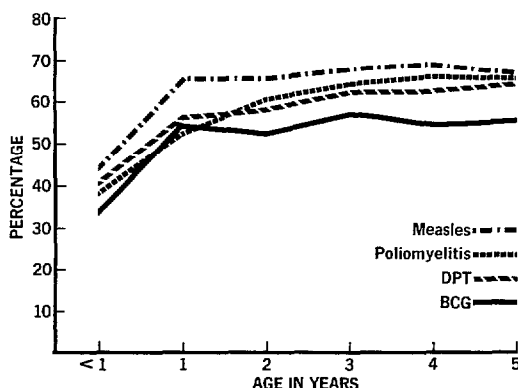


Table 7. Percentages of 1,931 survey children 1-5 years of age receiving BCG, complete poliomyelitis, complete DPT, and measles immunization, by area of residence and monthly family income.

Immunization	Total	Area of residence		Monthly family income, by quartiles			
		Urban	Rural	First quartile	Second quartile	Third quartile	Fourth quartile
BCG	55.3	62.1	50.8	53.6	56.7	64.5	63.0
Poliomyelitis	62.8	66.8	60.0	57.9	65.5	70.7	65.2
DPT	61.0	66.9	57.1	57.0	60.5	72.0	65.1
Measles	67.3	72.6	64.0	63.8	70.4	76.3	69.8

Table 8. Percentages of survey children receiving booster doses of BCG, poliomyelitis, DPT, and measles vaccines, by age and area of residence.

Child's area of residence and age	% receiving indicated vaccine booster				No. of children (unweighted)
	BCG	Poliomyelitis	DPT	Measles	
<i>Urban residence:</i>	22.0	35.0	33.4	23.1	1,184
<1 year	7.8	14.3	11.5	6.0	217
1-5 years	25.5	40.1	38.9	27.3	954
Unknown	- ^a	-	-	-	13
<i>Rural residence:</i>	10.1	27.7	25.4	10.2	1,215
<1 year	2.2	4.5	2.2	1.3	223
1-5 years	12.0	33.4	31.1	12.4	977
Unknown	- ^a	-	-	-	15
<i>Total:</i>	14.8	30.6	28.6	15.3	2,399
<1 year	4.5	8.4	5.9	3.2	440
1-5 years	17.4	36.1	34.2	18.3	1,931
Unknown	4.2	0.0	0.0	0.0	28

^aNo percentage given because too few (less than 25) children were in the indicated category.

increased as the monthly income of the child's family rose, but these percentage increases were only observed up to the third income quartile of the sample.

Ordinarily, one would not expect a child under one year of age to receive booster doses of any of the vaccines, but the survey data show that a small percentage of children under one year of age were said to have received booster shots (Tables 8 and 9). These children tended to live in urban areas and to come from higher-income families. For example, 11.5 per cent of the urban children under one year of age were said to have received booster doses of DPT vaccine, while only 2.2 per cent of the rural children were said to have done so. Likewise, 12.7 per cent of the children from families in the highest income quartile re-

portedly received a DPT booster before age one, while only 2.5 per cent of those in the lowest income quartile were said to have done so. The survey did not collect data about the place of vaccination, but we can assume that the source of vaccination would frequently be the same as that of well-baby care. Children under one year of age who received well-baby care in private medical facilities were more likely to have received booster shots than those who received their well-baby care in public facilities (Table 10).

Discussion

MCH Services

In general, the survey results indicate that MCH services are extensively used in Pana-

Table 9. Percentages of survey children receiving booster doses of BCG, poliomyelitis, DPT, and measles vaccines, by age and family income.

Child's age and family's monthly income	% receiving indicated vaccine booster				No. of children (unweighted)
	BCG	Poliomyelitis	DPT	Measles	
<i>First quartile:</i>	14.6	24.4	25.4	14.8	482
<1 years	1.2	2.5	2.5	1.2	87
1-5 years	17.6	29.4	30.6	17.9	392
Unknown	- ^a	-	-	-	3
<i>Second quartile:</i>	14.4	31.1	29.4	16.0	532
<1 year	5.0	6.8	6.8	3.6	89
1-5 years	16.6	36.6	34.5	18.8	436
Unknown	- ^a	-	-	-	7
<i>Third quartile:</i>	17.1	38.3	33.7	18.0	386
<1 year	2.6	11.2	5.3	1.3	66
1-5 years	20.6	44.9	40.5	21.9	314
Unknown	- ^a	-	-	-	6
<i>Fourth quartile:</i>	21.2	35.9	34.4	21.9	403
<1 year	9.2	16.7	12.7	5.8	81
1-5 years	24.6	41.3	40.5	26.4	317
Unknown	- ^a	-	-	-	5

^aNo percentages given because too few (less than 25) children were in the indicated category.

Table 10. Percentages of survey children less than one year of age receiving booster doses of BCG, poliomyelitis, DPT, and measles vaccines, by source of well-baby care.

Source of well-baby care	% receiving indicated vaccine booster				No. of children (unweighted)
	BCG	Poliomyelitis	DPT	Measles	
No well-baby care	2.9	4.3	3.6	1.4	110
Health Ministry hospital	1.8	8.7	6.1	4.3	43
Health Ministry center or post	4.4	8.2	5.8	2.2	196
Social Security Institute facility	2.7	11.6	4.5	4.5	49
Private facility	17.8	20.3	17.8	12.7	38

ma, thereby providing an index of good protection for the mother and child. The survey data also reveal trends in the use of MCH services according to various sociodemographic characteristics of the mother—such as area of residence (urban or rural), family income, education, work status, age, and number of living children. This knowledge can prove useful in orienting programs, assigning resources, and defining goals. For example, although the survey found good coverage of the general population, it also showed a need

to achieve more penetration of rural and low-income populations.

The relatively low use of MCH services by women whose age or parity places them at higher risk during pregnancy clearly shows that the program should promote more frequent use of those services as well as family planning services by these high-risk groups.

The extensive use of midwives for care during childbirth in rural areas is very significant. Since it would probably be difficult to replace the midwives with an institutional medical

service for cultural, geographic, and economic reasons, it is important that health institutions maintain close contact with them and provide them with training, with equipment, and with knowledge of facilities where they can refer patients.

The widespread use of contraceptive methods among users of MCH services is believed to arise from the fact that MCH and family planning services are closely related. Both services have the same basic objective—to provide better health conditions for the child and mother with the aim of obtaining social benefits. It is also true that a woman can learn about MCH services in a family planning clinic and can learn about family planning services during MCH visits.

Immunization Coverage

The survey data also indicate that Panama's immunization program has been providing good coverage. Table 11 compares the immunization status of the Panamanian survey children one through five years of age with survey data obtained from the United States (6). This comparison indicates that the levels of immunization in the two countries are similar. Furthermore, even though the Panama survey showed coverage levels to vary with place of residence, family income, and type of vaccine, the observed differences were small.

The high numbers of booster doses reported for children under one year of age could be due to excessive vaccine use or to a misreport-

ing of the number of doses received. The information in question was recorded from vaccination certificates when these were available; when such certificates were not available, the information was obtained from an adult respondent in the household. The source of information (vaccination certificate or adult respondent) was not recorded, so it is not known what proportion of the responses were obtained from vaccination certificates. It is certainly possible that respondents exaggerated the number of booster doses received by children living in their households. However, the percentage of children said to have received boosters before their first birthday was markedly higher among children from high-income urban families and among those who received well-baby care in private medical facilities, and these findings tend to argue against respondent error.

Comparison of Survey and Program Data on Immunization

The 1978 PAHO report entitled "Status of Immunization Programs in the American Region" (7) compares the vaccination coverage of children under one year of age in different countries of the Americas. Because this source provides program immunization data for children under one year of age in Panama, our comparison focuses on that age group.

There are important differences between the FP/MCH survey data and those of the Panama immunization program. This is partly because during a survey we can determine the percentage of children in a specific age group who have received a complete primary vaccination at the time of the survey. For children under one year of age, the denominator of this percentage includes all children born during the 12 months before the survey. However, it is recommended that certain vaccination series (e.g., poliomyelitis and DPT) should be completed at six months of age in Panama; and this means that according to official recommendations only children born in the first six months of the twelve-month peri-

Table 11. Percentages of the Panama survey children (1-5 years old) and U.S. children (1-4 years old) receiving complete primary poliomyelitis, DPT, and measles immunizations.

Immunization	% of children vaccinated	
	Panama ^a	USA ^b
Poliomyelitis	62.8 (60.2 – 65.4)	61.4
DPT	61.0 (58.3 – 63.7)	68.0
Measles	67.3 (64.7 – 69.9)	62.8

^aThe figures in parentheses are 95 per cent confidence limits that include the estimated design effect.

^bUnited States Immunization Survey, 1978 (6).

od before the survey should have received complete primary vaccination; so only 50 per cent of the children in the denominator are "eligible." Similarly, Panama's official recommendations state that measles vaccine should be given at nine months of age; this means that only children born in the first three months of the twelve-month period before the survey should have been vaccinated; and so only 25 per cent of the children in the denominator are "eligible." (Of course, this percentage of "eligibility" assumes that only routine vaccination has been carried out, and that there have been no mass campaigns that might have vaccinated children below the recommended age.)

To surmount such problems, the survey data can be analyzed excluding children outside the eligible age groups. For example, the Panama survey data were adjusted to study DPT and poliomyelitis vaccination of children 6-11 months of age and measles vaccination of children 9-11 months of age. (As already noted, there have been no mass campaigns in Panama.) If these adjustments were not made, the data would show artificially lower rates of vaccination for children less than one year of age, as may be seen in the first column of Table 12.

Hypothetically, we would expect that the percentages of eligible children receiving a complete series of DPT, poliomyelitis, and measles immunizations would be, respectively, two, two, and four times the percentages found for all children under one year of age. However, as already mentioned, despite the

lack of mass campaigns some children were said to have completed one or another primary immunization series before the recommended age. In each case, the number of children involved was known (e.g., about 6 per cent of those under six months old were reported to have received a complete series of poliomyelitis and DPT immunizations, and about 15 per cent of those under nine months old were reported to have received a measles vaccination); and so in each case the percentage of eligible children said to have received a complete immunization series could be determined.

Analyzing vaccination program data requires a different approach. It is possible to estimate the percentage of children in a specific age group that received primary immunization during a given period of time, usually a calendar year. In this case, the denominator is generally the midyear population estimate of the age group in question, and the numerator represents the number of immunizations given to children in that age group. For children under one year of age, the eligible population is actually a cohort of children born during the same and the previous year. And as Figure 4 shows, the size of this cohort does not depend on the length of time (three months or six months) that the children are of proper age for completion of primary immunization. In other words, 100 per cent of the children in the denominator are eligible.

This means it is not possible to directly compare the information obtained from the Panama survey with that from the vaccination

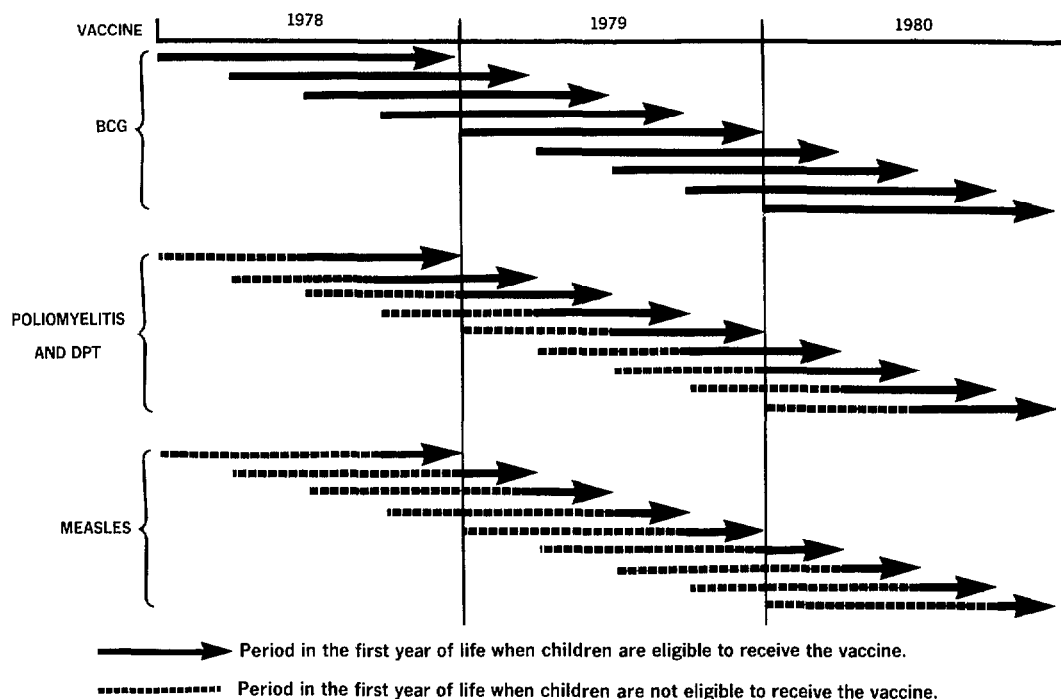
Table 12. Percentages of the Panama survey children less than one year old receiving complete primary BCG, poliomyelitis, DPT, and measles immunizations.

Immunization	All children <1 year old	"Eligible" children ^a <1 year old	Unweighted No. of "eligible" children ^a
BCG	34.6 (29.0 - 40.2) ^b	34.6 (29.0 - 40.2) ^b	440
Poliomyelitis	23.5 (18.6 - 28.4)	39.2 (31.5 - 46.7)	230
DPT	23.8 (18.9 - 28.7)	40.1 (32.3 - 47.9)	250
Measles	23.0 (18.2 - 27.8)	44.4 (33.7 - 55.1)	125

^a"Eligible" children: for BCG vaccine, all children in the sample; for poliomyelitis and DPT vaccines, all children 6-11 months old; for measles vaccine, all children 9-11 months old.

^bThe figures in parentheses are 95 per cent confidence limits that include the estimated design effect.

Figure 4. Cohorts (shown at three-month intervals) of children less than one year old who would be considered "eligible" to have received complete primary immunization with BCG, poliomyelitis and DPT, or measles vaccine administered as part of a continuous program, according to the recommendations of Panama's 1980 immunization manual (3).



program—because the survey finds the percentage of children protected by the vaccine at a point in time, while the program data shows the percentage of a particular cohort of children vaccinated over a one-year period. Nevertheless, some rough indirect comparisons can be made.

For example, Table 13 shows that 56 per cent of the Panamanian children under one year of age received BCG immunization during 1978 according to program data, while the survey data indicate that some 35 per cent of the children under one year of age had been vaccinated at the time of the survey in 1979. BCG vaccination is given at birth while the child is in the nursery. It is thus logical that the program data should show higher coverage than the survey data, since some mothers may not have known that their children were given BCG vaccine in the hospital.

Similarly, the program data show that about a third of the Panamanian children under one year of age were reported to have received a primary series of poliomyelitis or DPT immunizations during 1978, while the survey data indicate that 39 and 40 per cent, respectively, of the eligible children six to 11 months of age had received complete poliomyelitis and DPT vaccinations at the time of the survey in 1979. The survey data also show a greater percentage of eligible children vaccinated against measles, perhaps because the survey measured private sector vaccinations as well as the vaccinations provided through the public program.

In the future, we will be able to directly compare survey data with program data by making a record during the survey of the date when vaccination was completed and the birth date of the child. Using this information, it

Table 13. An indirect comparison between the 1979 Panama survey data and the 1978 Panama Immunization Program data regarding complete primary immunization of children less than one year old.

Immunization	Data from 1978 Panama Immunization Program: Percentages of children less than one year old vaccinated during 1978 ^a	1979 survey estimate of the percentages of eligible children ^b under one year old with complete primary vaccination
BCG	56	34.6
Poliomyelitis	34	39.2
DPT	33	40.1
Measles	37	44.4

^aSource: PAHO, *EPI Newsletter* (7).

^b"Eligible" children: for BCG vaccine, all children in the sample; for poliomyelitis and DPT vaccines, all children 6-11 months old; for measles vaccine, all children 9-11 months old.

will be possible to calculate the proportion of children more than one year old who received complete primary immunization during their first year of life. Such data would also permit one to estimate the proportion of children one to five years of age who received complete immunization during their first year of life, and to measure the program coverage achieved among children under one year of age during each of the past five years. For example, we would be able to compare the program coverage achieved the previous year with the cover-

age achieved five years ago. Such survey data could thus provide more than just information about the prevalence of vaccination at some point in time; they could also yield information about program coverage that could be compared with data obtained from the vaccination program itself; and they could be used in computing rates of disease in the unvaccinated and vaccinated populations, so that a measure of what the vaccine's effectiveness would be in the event of a disease outbreak could be determined.

SUMMARY

In 1979 a survey was conducted in Panama to determine how much various maternal and child health and family planning services were being utilized and how well the country's immunization program was providing coverage for young children. A total of 3,114 households were surveyed, 1,636 of these being considered urban and 1,478 being considered rural. At each eligible household, a woman 15-44 years old was sought as the respondent, and the main body of the survey questionnaire was administered to her. In all, responses were obtained from 2,348 women.

Nearly all the women who were married or living in consensual union at the time of the survey said they had used maternal and child health (MCH) services during their last pregnancy. Eighty per cent said they received prenatal care, 84 said they delivered their child at a medical facility, 67 per

cent said they received a postpartum checkup within a month of delivery, and 89 per cent said they obtained well-baby care for their newborns. The Health Ministry's hospitals, health centers, and health posts were the main sources of this care. However, the survey also showed a need to extend MCH services to rural and low-income populations, and to promote better coverage by MCH and family planning services for women whose youth, age, or parity placed them in high-risk groups.

Regarding immunizations, the survey indicated that Panama's national immunization program had been providing good coverage. Overall, the reported levels of completed primary vaccination against diphtheria-pertussis-tetanus, poliomyelitis, and measles in children 1-5 years old appeared similar to levels found in the United States. High numbers of booster doses reportedly received by

children under one year old could have been due to excessive vaccine use or to misreporting of the number of doses received. Direct comparison of these survey data with data from the national immunization program is not possible, but a useful

comparison of this sort could be made if planned future surveys record each child's date of birth and the dates when each primary vaccination or series of primary vaccinations was completed.

REFERENCES

(1) Monteith, R. S., J. E. Anderson, F. Mascarin, and L. Morris. Contraceptive Use and Fertility in the Republic of Panama. *Stud Fam Plann* 12(10):331-345, 1981.

(2) Morris, L. The Use of Contraceptive Prevalence Surveys to Evaluate Family Planning Programs in Latin America. In *1979 Proceedings of the Social Statistics Section of the American Statistical Association*. Washington, D. C., 1980, pp. 543-548.

(3) Panamá, Ministerio de Salud y Caja del Seguro Social. *Manual de inmunización de Panamá*. Panama City, 1980.

(4) World Health Organization. Guides to Assist

Countries and Regions in Preparing Manuals of Operation for Use in Immunization Programs. Geneva, 1977.

(5) Panamá, Ministerio de Salud. *Informe final de la encuesta nacional de fecundidad de 1976*. Panama City, 1977.

(6) United States Public Health Service, Center for Disease Control. *United States Immunization Survey: 1978*. Atlanta, Georgia, 1979.

(7) Pan American Health Organization. Status of immunization programs in the American region. *EPI Newsletter* 2(1):4-5, February 1980.

HEPATITIS SURVEILLANCE IN THE UNITED STATES

In the United States, hepatitis A morbidity reported for the two-year period October 1978 to November 1980 remained essentially the same as that reported from 1977 to 1978. Hepatitis B morbidity, however, increased during the same period, with increases being seen in the Middle Atlantic States (10 per cent), South Atlantic States (22 per cent), West South-Central States (12 per cent), and Pacific States (7 per cent). The case rates reported by the West North-Central States decreased by 10 per cent.

An upward trend was also noted for hepatitis of unspecified etiology, the level of morbidity being notably higher at the end of the reporting period than at the beginning.

Nationally, the case rates per 100,000 reported for 16 October-11 November 1978 were 1.1 cases of hepatitis A, 0.5 cases of hepatitis B, and 0.4 cases of unspecified etiology. The case rates per 100,000 reported for 11 October-8 November 1980 were 1.1 cases of hepatitis A, 0.7 cases of hepatitis B, and 0.5 cases of unknown etiology.

Source: United States Centers for Disease Control, *Hepatitis Surveillance Report No. 47*, December 1981.