

**MEASLES CONTROL AND
PREVENTION IN ZAMBIA**

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ACRONYMS

ARI	acute respiratory infection
BASICS	Basic Support for Institutionalizing Child Survival
CBOH	Central Board of Health
CIDs	community immunization days
DHMT	District Health Management Team
EPI	Expanded Program on Immunization
JICA	Japanese International Cooperation Agency
MCH	maternal and child health
NIDs	national immunization days
RSO	regional surveillance officer
STC	short-term consultant
UCI	Universal Childhood Immunization [Zambia national EPI]
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
UTH	University Teaching Hospital
WHO	World Health Organization

I EXECUTIVE SUMMARY

A BASICS technical officer visited Zambia between 9 and 25 September 1998 to work with the Central Board of Health (CBOH) on developing a strategy for controlling measles. The technical officer reviewed various epidemiological data on measles, analyzed recently collected data (1996 and 1997), and reviewed the CBOH draft guidelines on measles surveillance and several district reports on measles outbreak investigations.

The available epidemiologic information shows a typical pattern for measles in countries which have increased coverage over the past 15 years: shifting age groups, longer periods between epidemics, and persistent transmission. Although the data for 1998 are not yet complete, the country is most likely experiencing another major epidemic. Potential contributing factors for the continued high incidence of measles in Zambia include a combination of a decline in routine measles immunization coverage in some areas, logistics breakdowns, ineffective follow up on outbreaks, varying policies in the past on the minimum age for measles immunization, and inadequate vaccine supply management. In addition to the HMIS and surveillance data, information from the communities is needed to better define the system failures contributing to the outbreaks, and the risk factors and risk groups.

The more immediate needs for reducing the incidence of measles in Zambia include establishing active monitoring and surveillance in districts and health facilities, providing better direction for District Health Management Teams (DHMTs) on how to investigate measles outbreaks and implement the measles control policies and strategies, and defining district-specific actions for controlling and preventing future measles epidemics.

A draft, short-term action plan on a low cost measles control strategy was developed. This plan emphasizes surveillance, and increasing and sustaining timely immunization coverage in the communities. The plan involves conducting outbreak investigations, working with DHMTs on analyzing HMIS and outbreak investigation data, and implementing district/urban area specific actions to control and prevent measles. This approach will be implemented in 4 urban areas and eventually, nationwide. The strategy will emphasize routine monitoring to allow for timely adjustments, assessment of the effectiveness of the approach, and documentation for applying the approach in other areas.

The Measles Task Force will finalize the action plan and determine the budget requirements. Two additional visits from BASICS/Washington staff are needed to assist with implementation and to finalize concise guidelines on measles control for the DHMTs.

II PURPOSE OF VISIT

Together with members of the CBOH Measles Task Force, the technical officer was to review and analyze available CBOH data on measles and develop an action plan on a sustainable

measles control strategy that includes the immediate steps to implement the plan. The scope of work for this visit also specified conducting a community outbreak investigation. However, because the CBOH surveillance team was involved in HMIS training, this activity could not be performed.

III BACKGROUND

Zambia is extensively involved in health reform, which includes decentralizing funding and management from central to district levels. During September and October 1997, an international team reviewed the country's immunization program (UCI) under the premise of *Sustaining and Increasing Benefits of Immunization within Zambian Health Reform*. The reviewers concluded that Zambia had achieved sustained increases in vaccination coverage and that the immunization delivery system was well established. The reviewers also noted that improvements were needed in updating immunization policies, vaccine stock management, communication between health workers and clients, and disease surveillance.

Zambia has a long history of immunization campaigns that included measles vaccine, beginning with national immunization weeks in 1988. In January 1990, a nationwide mass immunization campaign was conducted. In 1994, a mass measles immunization campaign was conducted in Lusaka. A significant number of vaccination-associated abscesses were observed during this campaign.

The MOH policy on the minimum age for measles immunization has varied over the years. From 1982 to 1992, the minimum age for measles vaccine was age 7 months. Guidelines issued in 1995 on measles outbreak response gave instructions to immunize at ages 6 and 9 months for the duration of an outbreak. Some health centers continue to follow this schedule. (R. Feilden, BASICS trip report, April-May 1998)

The national EPI technical staff now consists of only two technicians and one manager, who is also responsible for other MCH services.

IV TRIP ACTIVITIES

The technical officer reviewed various epidemiological data on measles in Zambia, analyzed recently collected data (1996 and 1997) from health facilities in Kitwe, Ndolo, and Lusaka, reviewed and commented on the CBOH draft guidelines on measles surveillance and control, reviewed several measles outbreak investigation reports by DHMTs, and held discussions with CBOH/UCI (EPI)—the Measles Task Force, UTH, UNICEF, WHO, the WHO/APO child health advisor, USAID, and BASICS/Zambia staff.

V OBSERVATIONS

The following observations are based on discussions with the CBOH, WHO, UTH, UNICEF, BASICS, and also on the 1997 UCI (EPI) programme review and trip reports by WHO/STC G de Vries, BASICS consultant R Feilden, and BASICS Technical Officer R Steinglass

- 1 Data on the measles epidemiology are available through various sources, but it is difficult to put together a consistent national picture. Changes in the national reporting system over the years, the various methods of collection, and incomplete reporting, make it difficult to piece together long-term trends. Although incomplete, the available information shows a typical epidemiologic pattern for measles in countries that have increased coverage over the past 15 years: shifting age groups, longer periods between epidemics, and persistent transmission. Measles in Zambia occurs throughout the year, with the peak season between September and November. Data on measles patients in hospitals and health facilities in Lusaka, Kitwe, and Ndola for 1996 and 1998 were analyzed using Epi Info. Tables summarizing the results are found in Appendix B.
- 2 There are signs of slippage in immunization coverage as the country undergoes one of the most ambitious efforts in health sector reform and structural adjustment in Africa. A major shift to decentralize programs has reduced central management considerably. For example, the professional staff for central management of immunization services has been reduced to two technicians and one manager, who also has other MCH responsibilities. Major factors causing the decline in coverage and immunization services according to CBOH staff, the 1997 EPI review team, and consultants are attributed to lack of district funding, management and logistics problems, cold chain system breakdowns, and inadequate vaccine supply management.
- 3 Over the years, the MOH has had various policies on the minimum age for measles immunization (6 and 9 months, 7 months, 9 months). The current immunization schedule remains unclear in the districts. Immunizing children below WHO's recommended age for measles immunization in the past could be a contributing factor to the apparent increase in reported cases among teenagers and adults.
- 4 Zambia has a long history of mass measles immunization campaigns, such as the national immunization weeks during 1988, NIDs in early 1990, and a mass measles immunization campaign in Lusaka in 1994. Abscesses were reported during the 1994 measles immunization campaign in Lusaka.
- 5 Zambia lacks effective disease surveillance and monitoring systems. DHMTs lack guidance on the appropriate responses to measles outbreaks and frequently respond late in the outbreak with mass campaigns. Inconsistent routine immunization coverage data, going beyond 100 percent in 19 out of 62 districts, and very late feedback on disease

reporting make defining risk areas difficult. Varying adherence to a two-dose schedule (6 and 9 months) and inconsistent reporting practices could be resulting in double counting on the number of measles immunizations given, and thereby giving inflated coverage figures in some areas.

- 6 Essential strategies for measles control are included in the draft CBOH surveillance guidelines, but not specific information on how to implement the strategies. Comments on the CBOH surveillance guidelines are found in Appendix C.
- 7 UNICEF/Lusaka has received funding for supplemental immunization in urban area(s). The BASICS technical officer did not discuss with UNICEF or the CBOH any plans for supplemental measles immunization. Any major supplemental immunization activity should include a three to five year plan specifying the resource requirements for sustaining high routine coverage. It would be valuable to analyze the past immunization campaigns in Zambia to determine why these campaigns were not effective in preventing subsequent epidemics.
- 8 Where implemented, the revised HMIS is providing useful information about measles, but the data are not being used, especially locally. In addition to HMIS and hospital data, information from the community is needed to better define the system weaknesses, and risk factors and risk groups.
- 9 The UTH data from their measles and ARI studies in Lusaka provide very useful background information. They are also planning further studies on the interaction of measles and HIV.
- 10 The more immediate needs for improving measles control in Zambia are—
 - ▶ establishing active monitoring and surveillance in districts and health facilities, i.e., using the HMIS data
 - ▶ providing better direction for DHMTs on how to investigate measles outbreaks and implement measles control policies and strategies
 - ▶ developing district-specific action plans for controlling and preventing future measles epidemics
 - ▶ identifying and using local resources to maintain awareness about measles disease and prevention, and to sustain high immunization coverage in communities

Action plans should be based on local information (HMIS and information collected from communities) and tailored to the local situation: level of coverage, urban, rural, available

resources, and capacity to fund and implement control efforts. These actions should be sustainable and should complement existing work.

11 The MOH and CBOH formed a Measles Task Force, consisting of the national epidemiologist, the national surveillance officers (CBOH/WHO), the APO/WHO (former), UNICEF, the University Teaching Hospital, BASICS, and other representatives from the CBOH. The members of the task force show a high level of commitment and skill.

12 A draft, short-term action plan on a low cost measles control strategy was developed during this visit. This plan emphasizes surveillance, and increasing and sustaining timely immunization coverage in the communities. The plan involves training regional surveillance officers and a DHMT to conduct a community outbreak investigation, with the purpose of defining the system weaknesses, and risk factors causing the measles outbreaks. The CBOH surveillance team (regional surveillance officers and CBOH epidemiologists) will also work with DHMTs to identify community resources for improving awareness about measles and for improving immunization coverage. The surveillance team will work with DHMTs using HMIS and outbreak investigation data to outline district-specific, immediate- and long-term steps to control and prevent measles (appendixes D, E, and F).

This measles control strategy emphasizes local monitoring and surveillance. For example, maintaining a simple graph on the weekly or monthly reported measles cases in every health facility and district will not only serve as a constant reminder of the measles problem, but also will promote a more timely response to outbreaks.

13 The task force will initiate this strategy in four urban areas using the regional surveillance officers and the CBOH epidemiologists as the key implementers. One district (probably Lusaka) will be used for on-the-job training for the surveillance officers and CBOH team.

A Measles Task Force working group is preparing a more detailed plan and budget for implementing both a short-term and a long-term strategy, including initiating steps for conducting more thorough cold chain assessments in the areas selected for implementing the control strategy. The working group will collect information for selecting the urban areas for implementing the strategy, and will select the communities for outbreak investigations.

14 The measles control action plan in Zambia will contain a monitoring and evaluation component, so that the effectiveness of the strategy will be continuously assessed, both in the short term and for years to come.

15 Comments on the attached graph Appendix G—Measles Cases and Measles Immunization, Kalabo District, 1992-1998

- ▶ 1992 until August 1998, 1995 had the highest measles immunization coverage, 96 percent, yet also the highest number of reported measles cases
- ▶ After 1995, there was a dramatic decline in both coverage and reported cases
- ▶ After two years of low coverage, 58 percent in 1997, another major epidemic has occurred in 1998 (note the data for 1998 are not yet complete, January-August)
- ▶ This graph demonstrates a typical response to measles epidemics. When epidemics occur, awareness is very high and considerable effort is directed at intensifying immunization. When the epidemic subsides, efforts on maintaining high coverage decline. Had the 96 percent coverage in 1995 been sustained through routine immunization, the 1998 epidemic could have been much less severe. Mass immunization campaigns alone have not been the answer for measles control.
- ▶ What is being done to strengthen routine services in Kalabo District so that future epidemics are prevented?

16 The measles control strategy in Zambia aims to develop a foundation for sustained measles control, but this is only one step for controlling measles. The measles problem in Zambia involves the same obstacles confronting the entire health care system: logistics breakdowns, lack of funds, lack of and utilization of epidemiologic information, health system reform, and the economy.

VI RECOMMENDATIONS

- ▶ The CBOH draft measles control strategy and budget requirements should be finalized as soon as possible (Measles Task Force)
- ▶ To better define the system weakness, and the risk factors and risk groups, an outbreak investigation should be conducted in several communities. Guidelines on investigating a measles outbreak and on measles control that were developed in Uganda were left with the CBOH (CBOH, BASICS)
- ▶ The revised immunization policies prepared during the past year should be communicated to the districts as soon as possible (MOH, CBOH)

- ▶ DHMTs need concise supplemental guidelines on conducting a measles outbreak investigation, on practical and effective responses to measles outbreaks, and on preventing future outbreaks. These supplemental guidelines should be developed during the next few months, based on the experience gained implementing the strategy. The distribution of the revised policies should not be delayed by the completion of the supplemental guidelines. (Measles Task Force, BASICS)
- ▶ In addition to routinely monitoring immunizations and disease, the Measles Task Force needs to define any other practical indicators for monitoring the effectiveness of their measles control strategy.
- ▶ Any major supplemental immunization activity should include a three to five year plan that specifies the resource requirements for maintaining high routine coverage.
- ▶ The measles problem provides a practical opportunity for on-the-job training for health workers on using their HMIS data.
- ▶ Timely monitoring and surveillance in health facilities and districts is essential for maintaining awareness of the measles problem and to better define risk areas.

VII FOLLOW UP ACTIONS

- 1 The Measles Task Force should finalize the measles control action plan, including the funding requirements.
- 2 The Measles Task Force will select an urban area for developing the implementation process (i.e., community outbreak investigation, resource identification, district planning) and also three or four other urban areas for implementing measles control efforts within the next few months.
- 3 Follow-up technical assistance from BASICS/Washington before February 1999 will be provided to assist with conducting outbreak investigations and to initiate a district planning process. (BASICS and CBOH)
- 4 A rapid assessment on the effectiveness of the implementation of the strategy should be conducted four to six months after implementation is initiated. (BASICS and CBOH)
- 5 The regional surveillance officers (RSO) and CBOH participants will need per diem and transport expenses for outbreak investigations and district planning, which should be conducted in selected urban areas before February 1999. Such funding is available through the RSO's WHO budget.

- 6 Based on the experience gained over the next several months, the Measles Task Force should prepare concise guidelines on implementing the measles control strategy so that the strategy can be expanded nationwide (BASICS and CBOH)
- 7 Issues which were not discussed adequately and require follow up
 - ▶ improvement of the prevention of nosocomial transmission of measles
 - ▶ additional indicators, besides coverage and reported cases for monitoring the strategy
 - ▶ opportunities for linking UTH research with the CBOH measles control strategy
 - ▶ UNICEF plans for the recently allocated funding for measles in Zambia
 - ▶ risk and prevention of outbreaks from cross border and refugee populations
 - ▶ measles mortality reduction through improved case management

APPENDIXES

APPENDIX A
PERSONS CONTACTED

Appendix A

Persons Contacted

USAID/Zambia

Paul Zeitz
Robert Clay

Child Survival and HIV-AIDS Advisor
Health & Population Officer

UNICEF

Christiane Rudert-Thorpe

Asst Project Officer-Health

CBOH

Ms Leo Chivundu
Mr Mitumbishe
Evans Mupela
B Sikateyo
Dr R Chimba

WHO Regional Surveillance Officer
UCI Logistics Officer
Epidemiologist Monitoring Specialist
Manager, IHSR
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Dr Mwaka Monze

Virologist
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WHO

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Dr Ini Huijts
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WHO Representative
Short Term Professional
STC

BASICS

Dr Remi Sogunro
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Chief of Party
Health Training Advisor
Operations/Administrative Officer
Training Officer

APPENDIX B

**MEASLES DATA FROM SELECTED HOSPITALS AND HEALTH
FACILITIES IN ZAMBIA, 1996-97
(EPI INFO ANALYSIS)**

TABLE 1
DISTRIBUTION OF MEASLES PATIENTS BY FACILITY,
LUSAKA, KITWE, & NDOLA, 1996

FACILITY	Freq	Percent	Cum
A DAVISON HOSP	22	0.9%	0.9%
KITWE CENTRAL HOSP	257	10.8%	11.7%
KITWE URBAN CLINICS	406	17.0%	28.7%
LUSAKA URBAN CLINICS	132	5.5%	34.2%
UTH	1570	65.8%	100.0%
Total	2387	100.0%	

TABLE 2
DISTRIBUTION OF MEASLES PATIENTS BY FACILITY,
LUSAKA KITWE, & NDOLA, 1997

FACILITY	Freq	Percent	Cum
A DAVISON HOSP	334	13.8%	13.8%
KITWE CENTRAL HOSP	466	19.3%	33.2%
KITWE URBAN CLINICS	823	34.1%	67.3%
LUSAKA URBAN CLINICS	276	11.4%	78.7%
NDOLA URBAN CLINICS	52	2.2%	80.9%
UTH	462	19.1%	100.0%
Total	2413	100.0%	

TABLE 3
DISTRIBUTION OF MEASLES PATIENTS BY MONTH,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1996

YEAR_1996	Freq	Percent	Cum
1 JANUARY	245	10.3%	10.3%
2 FEBRUARY	183	7.7%	17.9%
3 MARCH	140	5.9%	23.8%
4 APRIL	107	4.5%	28.3%
5 MAY	110	4.6%	32.9%
6 JUNE	88	3.7%	36.6%
7 JULY	101	4.2%	40.8%
8 AUGUST	183	7.7%	48.5%
9 SEPTEMBER	223	9.3%	57.8%
10 OCTOBER	361	15.1%	72.9%
11 NOVEMBER	415	17.4%	90.3%
12 DECEMBER	231	9.7%	100.0%
Total	2387	100.0%	

TABLE 4
DISTRIBUTION OF MEASLES PATIENTS BY MONTH,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1997

YEAR_1997	Freq	Percent	Cum
1 JANUARY	158	6.5%	6.5%
2 FEBRUARY	88	3.6%	10.2%
3 MARCH	86	3.6%	13.8%
4 APRIL	80	3.3%	17.1%
5 MAY	138	5.7%	22.8%
6 JUNE	93	3.9%	26.6%
7 JULY	153	6.3%	33.0%
8 AUGUST	239	9.9%	42.9%
9 SEPTEMBER	505	20.9%	63.8%
10 OCTOBER	322	13.3%	77.2%
11 NOVEMBER	349	14.5%	91.6%
12 DECEMBER	202	8.4%	100.0%
Total	2413	100.0%	

TABLE 5 A
MEASLES PATIENTS, AGE DISTRIBUTION,
KITWE URBAN CLINICS, 1996

AGE_GROUP	Freq	Percent	Cum
1 < 6 MONTHS	17	4.2%	4.2%
2 6 - 8 MONTHS	44	10.8%	15.0%
3 9 - 11 MONTHS	45	11.1%	26.1%
4 12 - 23 MONTHS	78	19.2%	45.3%
5 2 YEARS	50	12.3%	57.6%
6 3 YEARS	38	9.4%	67.0%
7 4 YEARS	41	10.1%	77.1%
8 5 - 9 YEARS	51	12.6%	89.7%
9 10 - 14 YEARS	29	7.1%	96.8%
10 > 14 YEARS	13	3.2%	100.0%
Total	406	100.0%	

TABLE 5 B
MEASLES PATIENTS, AGE DISTRIBUTION,
KITWE CENTRAL HOSPITAL, 1996

AGE_GROUP	Freq	Percent	Cum
1 < 6 MONTHS	19	7.4%	7.4%
2 6 - 8 MONTHS	55	21.4%	28.8%
3 9 - 11 MONTHS	30	11.7%	40.5%
4 12 - 23 MONTHS	51	19.8%	60.3%
5 2 YEARS	15	5.8%	66.1%
6 3 YEARS	26	10.1%	76.3%
7 4 YEARS	24	9.3%	85.6%
8 5 - 9 YEARS	26	10.1%	95.7%
9 10 - 14 YEARS	10	3.9%	99.6%
10 > 14 YEARS	1	0.4%	100.0%
Total	257	100.0%	

TABLE 6 A
 MEASLES PATIENTS, AGE DISTRIBUTION,
 UNIVERSITY TEACHING HOSPITAL, LUSAKA, 1996

AGE_GROUP	Freq	Percent	Cum
1 < 6 MONTHS	107	6 8%	6 8%
2 6 - 8 MONTHS	304	19 4%	26 2%
3 9 - 11 MONTHS	199	12 7%	38 9%
4 12 - 23 MONTHS	334	21 3%	60 2%
5 2 YEARS	141	9 0%	69 2%
6 3 YEARS	99	6 3%	75 5%
7 4 YEARS	105	6 7%	82 2%
8 5 - 9 YEARS	169	10 8%	93 0%
9 10 - 14 YEARS	108	6 9%	99 9%
10 > 14 YEARS	2	0 1%	100 0%
Total	1568	100 0%	

TABLE 6 B
 MEASLES PATIENTS, AGE DISTRIBUTION,
 UNIVERSITY TEACHING HOSPITAL, LUSAKA, 1997

AGE_GROUP	Freq	Percent	Cum
1 < 6 MONTHS	40	8 7%	8 7%
2 6 - 8 MONTHS	83	18 0%	26 6%
3 9 - 11 MONTHS	58	12 6%	39 2%
4 12 - 23 MONTHS	95	20 6%	59 7%
5 2 YEARS	43	9 3%	69 0%
6 3 YEARS	31	6 7%	75 8%
7 4 YEARS	23	5 0%	80 7%
8 5 - 9 YEARS	55	11 9%	92 6%
9 10 - 14 YEARS	33	7 1%	99 8%
10 > 14 YEARS	1	0 2%	100 0%
Total	462	100 0%	

TABLE 6 C
 MEASLES PATIENTS, AGE DISTRIBUTION,
 URBAN CLINICS, LUSAKA, 1996

AGE_GROUP	Freq	Percent	Cum
2 6 - 8 MONTHS	10	8 6%	8 6%
3 9 - 11 MONTHS	10	8 6%	17 2%
4 12 - 23 MONTHS	20	17 2%	34 5%
5 2 YEARS	17	14 7%	49 1%
6 3 YEARS	11	9 5%	58 6%
7 4 YEARS	7	6 0%	64 7%
8 5 - 9 YEARS	25	21 6%	86 2%
9 10 - 14 YEARS	7	6 0%	92 2%
10 > 14 YEARS	9	7 8%	100 0%
Total	116	100 0%	

TABLE 6 D
 MEASLES PATIENTS, AGE DISTRIBUTION,
 LUSAKA URBAN CLINICS, 1997

AGE_GROUP	Freq	Percent	Cum
1 < 6 MONTHS	1	0 4%	0 4%
2 6 - 8 MONTHS	2	0 7%	1 1%
3 9 - 11 MONTHS	22	8 1%	9 2%
4 12 - 23 MONTHS	55	20 3%	29 5%
5 2 YEARS	48	17 7%	47 2%
6 3 YEARS	32	11 8%	59 0%
7 4 YEARS	30	11 1%	70 1%
8 5 - 9 YEARS	53	19 6%	89 7%
9 10 - 14 YEARS	19	7 0%	96 7%
10 > 14 YEARS	9	3 3%	100 0%
Total	271	100 0%	

TABLE 7
MEASLES PATIENTS, AGE DISTRIBUTION,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1996

AGE_GROUP	Freq	Percent	Cum
1 < 6 MONTHS	144	6 1%	6 1%
2 6 - 8 MONTHS	415	17 5%	23 6%
3 9 - 11 MONTHS	287	12 1%	35 7%
4 12 - 23 MONTHS	485	20 5%	56 2%
5 2 YEARS	226	9 5%	65 8%
6 3 YEARS	175	7 4%	73 1%
7 4 YEARS	178	7 5%	80 7%
8 5 - 9 YEARS	276	11 7%	92 3%
9 10 - 14 YEARS	157	6 6%	98 9%
10 > 14 YEARS	25	1 1%	100 0%
Total	2368	100 0%	

TABLE 8
AGE DISTRIBUTION OF MEASLES PATIENTS,
HEALTH FACILITIES, LUSAKA, KITWE, & NDOLA, 1997

AGE_GROUP	Freq	Percent	Cum
1 < 6 MONTHS	131	5 5%	5 5%
2 6 - 8 MONTHS	281	11 8%	17 2%
3 9 - 11 MONTHS	225	9 4%	26 6%
4 12 - 23 MONTHS	425	17 8%	44 4%
5 2 YEARS	259	10 8%	55 2%
6 3 YEARS	203	8 5%	63 7%
7 4 YEARS	207	8 7%	72 4%
8 5 - 9 YEARS	435	18 2%	90 6%
9 10 - 14 YEARS	175	7 3%	97 9%
10 > 14 YEARS	50	2 1%	100 0%
Total	2391	100 0%	

TABLE 9
MEASLES PATIENTS, AGE BY IMMUNIZATION STATUS,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1996

	AGE_GROUP	IMM_STATUS			Total
		IMMUNIZED	NOT IMM	UNKNOWN	
1	< 6 MONTHS	2	86	56	144
2	6 - 8 MONTHS	12	259	144	415
3	9 - 11 MONTHS	66	98	123	287
4	12 - 23 MONTHS	182	77	226	485
5	2 YEARS	81	25	120	226
6	3 YEARS	73	15	87	175
7	4 YEARS	47	19	112	178
8	5 - 9 YEARS	54	28	194	276
9	10 - 14 YEARS	35	9	113	157
10	> 14 YEARS	7	1	17	25
Total		559	617	1192	2368

TABLE 10
MEASLES PATIENTS AGE BY IMMUNIZATION STATUS, EXCLUDING UNKNOWN,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1996

	AGE_GROUP	IMM_STATUS		Total
		IMMUNIZED	NOT IMM	
1	< 6 MONTHS	2	86	88
		2 3%	97 7%	7 5%
2	6 - 8 MONTHS	12	259	271
		4 4%	95 6%	23 0%
3	9 - 11 MONTHS	66	98	164
		40 2%	59 8%	13 9%
4	12 - 23 MONTHS	182	77	259
		70 3%	29 7%	22 0%
5	2 YEARS	81	25	106
		76 4%	23 6%	9 0%
6	3 YEARS	73	15	88
		83 0%	17 0%	7 5%
7	4 YEARS	47	19	66
		71 2%	28 8%	5 6%
8	5 - 9 YEARS	54	28	82
		65 9%	34 1%	7 0%
9	10 - 14 YEARS	35	9	44
		79 5%	20 5%	3 7%
10	> 14 YEARS	7	1	8
		87 5%	12 5%	0 7%
Total		559	617	1176
		47 5%	52 5%	

TABLE 11
MEASLES PATIENTS, AGE BY IMMUNIZATION STATUS,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1997

	AGE_GROUP	IMM_STATUS			Total
		IMMUNIZED	NOT IMM	UNKNOWN	
1	< 6 MONTHS	0	105	26	131
2	6 - 8 MONTHS	12	218	51	281
3	9 - 11 MONTHS	87	84	54	225
4	12 - 23 MONTHS	246	76	103	425
5	2 YEARS	141	51	67	259
6	3 YEARS	113	35	55	203
7	4 YEARS	103	23	81	207
8	5 - 9 YEARS	175	46	214	435
9	10 - 14 YEARS	60	18	97	175
10	> 14 YEARS	4	4	42	50
Total		941	660	790	2391

TABLE 12
MEASLES PATIENTS, AGE BY IMMUNIZATION STATUS, EXCLUDING UNKNOWN,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1997

	AGE_GROUP	IMM_STATUS		Total
		IMMUNIZED	NOT IMM	
1	< 6 MONTHS	0	105	105
		0 0%	100 0%	6 6%
2	6 - 8 MONTHS	12	218	230
		5 2%	94 8%	14 4%
3	9 - 11 MONTHS	87	84	171
		50 9%	49 1%	10 7%
4	12 - 23 MONTHS	246	76	322
		76 4%	23 6%	20 1%
5	2 YEARS	141	51	192
		73 4%	26 6%	12 0%
6	3 YEARS	113	35	148
		76 4%	23 6%	9 2%
7	4 YEARS	103	23	126
		81 7%	18 3%	7 9%
8	5 - 9 YEARS	175	46	221
		79 2%	20 8%	13 8%
9	10 - 14 YEARS	60	18	78
		76 9%	23 1%	4 9%
10	> 14 YEARS	4	4	8
		50 0%	50 0%	0 5%
Total		941	660	1601
		58 8%	41 2%	

TABLE 13
MEASLES PATIENTS, OUTCOME,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1996

OUTCOME	Freq	Percent	Cum
1 SURVIVED	1821	77 7%	77 7%
2 DIED	312	13 3%	91.0%
3 UNKNOWN	210	9 0%	100 0%
Total	2343	100 0%	

TABLE 14
MEASLES PATIENTS, BY OUTCOME AND IMMUNIZATION STATUS,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1996

OUTCOME	IMM STATUS			Total
	IMMUNIZED	NOT IMM	UNKNOWN	
1 SURVIVED	432 23 7% 78 1%	475 26.1% 77 7%	914 50 2% 77 5%	1821 77 7%
2 DIED	37 11 9% 6 7%	81 26 0% 13 3%	194 62 2% 16 5%	312 13 3%
3 UNKNOWN	84 40 0% 15 2%	55 26 2% 9 0%	71 33 8% 6 0%	210 9 0%
Total	553 23 6%	611 26 1%	1179 50 3%	2343

TABLE 15
MEASLES PATIENTS, BY AGE AND OUTCOME,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1996

	AGE_GROUP	OUTCOME			Total
		1 SURVIVED	2 DIED	3 UNKNOWN	
1	< 6 MONTHS	111	21	9	141
	>	78 7%	14.9%	6.4%	6 0%
		6 1%	6 7%	4.3%	
2	6 - 8 MONTHS	318	67	28	413
	>	77 0%	16 2%	6.8%	17 6%
		17 5%	21 5%	13 3%	
3	9 - 11 MONTHS	222	42	21	285
	>	77 9%	14 7%	7 4%	12 2%
		12 2%	13 5%	10 0%	
4	12 - 23 MONTHS	358	85	39	482
	>	74 3%	17 6%	8 1%	20 6%
		19 7%	27 2%	18 6%	
5	2 YEARS	158	37	29	224
	>	70 5%	16 5%	12 9%	9 6%
		8 7%	11 9%	13 8%	
6	3 YEARS	131	21	21	173
	>	75 7%	12 1%	12 1%	7 4%
		7 2%	6 7%	10 0%	
7	4 YEARS	144	13	17	174
	>	82 8%	7 5%	9 8%	7 4%
		7 9%	4 2%	8 1%	
8	5 - 9 YEARS	231	20	22	273
	>	84 6%	7 3%	8 1%	11 7%
		12 7%	6 4%	10 5%	
9	10 - 14 YEARS	131	6	16	153
	>	85 6%	3 9%	10 5%	6 5%
		7 2%	1 9%	7 6%	
10	> 14 YEARS	17	0	8	25
	>	68 0%	0 0%	32 0%	1 1%
		0 9%	0 0%	3 8%	
Total		1821	312	210	2343
		77 7%	13 3%	9 0%	

TABLE 16
MEASLES PATIENTS, OUTCOME,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1997

OUTCOME	Freq	Percent	Cum
1 SURVIVED	2009	84 5%	84 5%
2 DIED	82	3 4%	88 0%
3 UNKNOWN	286	12 0%	100 0%
Total	2377	100 0%	

TABLE 17
MEASLES PATIENTS, BY OUTCOME AND IMMUNIZATION STATUS,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1997

OUTCOME	IMM STATUS			Total
	IMMUNIZED	NOT IMM	UNKNOWN	
1 SURVIVED	804	550	655	2009
>	40 0%	27 4%	32 6%	> 84 5%
2 DIED	86 2%	84 0%	83 0%	
>	23	26	33	82
3 UNKNOWN	28 0%	31 7%	40 2%	> 3 4%
>	2 5%	4 0%	4.2%	
Total	106	79	101	286
>	37 1%	27 6%	35 3%	> 12 0%
	11 4%	12 1%	12 8%	
Total	933	655	789	2377
	39 3%	27 6%	33 2%	

TABLE 18
MEASLES PATIENTS, BY AGE AND OUTCOME,
HEALTH FACILITIES IN LUSAKA, KITWE, & NDOLA, 1997

AGE_GROUP	OUTCOME			Total
	1 SURVIVED	2 DIED	3 UNKNOWN	
1 < 6 MONTHS	113	5	13	131
>	86 3%	3 8%	9 9%	> 5 5%
2 6 - 8 MONTHS	5 6%	6 1%	4 5%	
>	241	10	30	281
3 9 - 11 MONTHS	85 8%	3 6%	10 7%	> 11 8%
>	12 0%	12 2%	10 5%	
4 12 - 23 MONTHS	190	15	20	225
>	84 4%	6 7%	8 9%	> 9 5%
5 2 YEARS	9 5%	18 3%	7 0%	
>	354	20	50	424
6 3 YEARS	83 5%	4 7%	11 8%	> 17 8%
>	17 6%	24 4%	17 5%	
7 4 YEARS	210	5	42	257
>	81 7%	1 9%	16 3%	> 10 8%
8 5 - 9 YEARS	10 5%	6 1%	14 7%	
>	166	7	27	200
9 10 - 14 YEARS	83 0%	3 5%	13 5%	> 8 4%
>	8 3%	8 5%	9 4%	
10 > 14 YEARS	176	6	24	206
>	85 4%	2 9%	11 7%	> 8 7%
11 5 - 9 YEARS	8 8%	7 3%	8 4%	
>	367	11	52	430
12 10 - 14 YEARS	85 3%	2.6%	12 1%	> 18 1%
>	18 3%	13 4%	18 2%	
13 10 - 14 YEARS	153	2	18	173
>	88 4%	1 2%	10 4%	> 7 3%
14 > 14 YEARS	7 6%	2 4%	6 3%	
>	39	1	10	50
Total	78 0%	2 0%	20 0%	> 2 1%
	1 9%	1 2%	3 5%	
Total	2009	82	286	2377
	84 5%	3 4%	12 0%	

APPENDIX C

**COMMENTS BY M. WEEKS ON THE CBOH ZAMBIA
*GUIDELINES FOR MEASLES SURVEILLANCE***

Appendix C

Comments by M Weeks on the CBOH Zambia *Guidelines for Measles Surveillance*

Strategies to control measles add details on how strategies can be implemented

- 1 Improve routine immunization coverage Add
 - Design and implement a community focused approach for sustaining 90% or greater immunization coverage by catchment area
 - Reinforce efforts to reduce missed opportunities for immunization in hospitals and clinics
 - Promote use of existing resources (CHWs, Neighborhood Committees, other projects, etc) to maintain awareness about immunization
- 2 Improve case and hospital management to prevent, identify, and treat complications associated with measles and nosocomial transmission Add
 - Provide IMCI training for health workers (ongoing)
 - Increase awareness among mothers on taking care of children with measles
 - Reduce risk for nosocomial transmission by re-emphasizing patient isolation and immunization on wards
 - Re-emphasize routine vitamin A distribution during routine health services
- 3 Implement supplemental immunization activities in high risk areas and populations Add
 - Develop guidelines for DHMTs on when and where to implement supplemental immunization, requirements for requesting vaccines and supplies, how to monitor and report on supplemental immunization activities, determining the age range for immunization
 - Closely monitor routine immunization coverage to ensure that high routine immunization is being maintained
- 4 Set up high quality surveillance Add
 - Improve capacity of the DHMT to maintain active surveillance using HMIS data to investigate outbreaks and to identify risk areas and risk groups

- Promote the use of HMIS data at the health facility level to monitor disease trends and outbreaks by catchment area
- Periodically collect supplemental information from communities on measles cases and outbreaks

Types of Surveillance What about feedback from the district and region?

Data analysis, presentation, reports Measles vaccination coverage by year, and by month
Cases by age group < 9 months and 9 - 11 months

Immunization status pie chart include "unknown"

Threshold for an outbreak I suggest using a fixed number, e.g., 5 cases Comparing with previous year could be misleading due to inaccurate reporting or long-term trend Cases seen at the health facility probably represent only a small proportion of what is occurring in the community Can also add that it is not necessary to investigate every outbreak, depends on resources and information needs

APPENDIX D

**PROPOSED SHORT TERM ACTION PLAN FOR IMPLEMENTING A
COMMUNITY FOCUSED MEASLES CONTROL STRATEGY,
OCTOBER 1998-MAY 1999**

Appendix D

Proposed Short Term Action Plan for Implementing a Community Focused Measles Control Strategy, October 1998-May 1999

Immediate Priorities

- 1 Establish a foundation for controlling and monitoring measles
- 2 Develop, implement, and document a sustainable strategy for controlling measles
- 3 Urban measles control

Actions

- 1 Communicate EPI Disease Surveillance Policies
- 2 Prepare the CBOH Surveillance team on data utilization (HMIS), outbreak investigation and risk group identification
- 3 Initiate practice of keeping a measles graph in districts and facilities using HMIS data to maintain active surveillance for outbreaks and to monitor the effects of the measles control efforts
- 4 Design and implement a community focused sustainable approach for controlling/preventing measles in an urban area. The approach developed will serve as a supplemental guide on measles control for urban areas and districts and will include the following
 - a low cost approach for improving community awareness about the importance of immunization, measles disease (neighborhood committees, CHWs, etc),
 - finding and immunizing defaulters (patient registers, any household visits),
 - finding and immunizing risk groups (community immunization days if appropriate), and
 - using HMIS data to actively monitor measles locally (surveillance)

Measles Control Action Plan, Schedule of Activities

The following activities will be conducted in selected communities in an urban area to develop operational guidelines on measles control for DHMT's

October - December 1998

- 1 Select several communities for collecting information on measles cases, immunization coverage, knowledge of immunization services, reasons for not being immunized Using community data and HMIS data identify risk factors and risk areas for measles (Note outbreak investigation will be low cost and not labor intensive, a management tool, not a "survey ")

Duration preparation (instrument design, site identification, inform communities Oct), field work 2-3 days, analysis report 2 days

Participants CBOH surveillance team, DHMT, BASICS T O

Additional Costs field allowances for out of town surveillance officers, 2-3 vehicles, fuel stationary (minimal), local staff allowances for field work (?)

- 2 Develop and implement use of a graph for weekly monitoring of measles cases in health facilities

Participants CBOH surveillance team, DHMT

Additional costs none (?)

- 3 Identify and contact potential community mobilization resources for reinforcing awareness about immunization, reporting suspect cases to the health facility, and checking immunization cards and referring children needing an immunization

Participants CBOH, DHMT, Regional Surveillance Officer (RSO)

- 4 Meet selected health facilities to discuss and implement ROUTINE tracing and immunizing defaulters using their patient registers (or other community registers ?) Note requires periodic follow up

Participants CBOH, DHMT, RSO

- 5 Develop a concise short-term district plan of action for immunizing risk groups and/or risk communities

Participants CBOH, DHMT, RSO, BASICS T O

- 6 Begin draft of supplemental guidelines on measles control (how to do it guide)

Participants CBOH surveillance team, Task Force, BASICS T O

February

- 1 Review progress on the District's action plan, practice of maintaining measles graphs, community efforts to improve coverage (one week)

Participants CBOH, DHMT

April

- 1 Assess effects of the measles control strategy on the selected communities, (use of HMIS data, coverage, implementation of District action plan, community resources in action, similar to November exercise)
- 2 Finalize supplemental guidelines

Participants CBOH surveillance team, DHMT, Task Force, BASICS T O

Additional costs similar to November exercise

May

- 1 Develop action plan for implementing the strategy in other urban areas and districts
- 2 Print and distribute supplemental guidelines

Participants CBOH, Measles Task Force

Additional Costs printing

Issues

- 1 To be effective this Action Plan requires assigning at least one CBOH staff member, periodic monitoring by the Measles Task Force, and active participation by a DHMT to ensure that the activities are carried out. These activities and the Action Plan are not intended to increase the work load on DHMTs or other health/community workers
- 2 This Action Plan represents only the beginning steps for establishing more effective measles control. Measles is a long term problem which can not be solved in a few months
- 3 Ongoing and reliable monitoring/surveillance is essential to ensure that the strategy is having a long term impact
- 4 Other needs: improving practices on case and hospital management of patients (nosocomial transmission), cross border transmission, research (e.g. HIV/measles, rubella), booster dose for school age children?
- 5 Longer Term Plan: Implement strategy in remaining urban areas, apply the strategy in a rural area, revise guidelines if necessary, implement in rural areas, maintain active monitoring/surveillance !!!

APPENDIX E
(OVER HEAD)

**SUMMARY OF THE PRIORITY NEEDS FOR CONTROLLING MEASLES
IN ZAMBIA**

Appendix E
(over head)

Summary of the PRIORITY NEEDS for controlling measles in Zambia

Consistent and reliable Information for making decisions

Guidelines for DHMTs on how to implement the measles control policies

Active monitoring and surveillance, i e using the HMIS data

District specific action plans (tailored to the local situation level of coverage, urban, rural, available resources/capacity, preventive, sustainable and flexible, supplemental not extensive plans)

Active monitoring and surveillance

APPENDIX F
(OVERHEAD)

**PROPOSED SHORT-TERM ACTION PLAN FOR IMPLEMENTING A
COMMUNITY FOCUSED MEASLES CONTROL STRATEGY, OCTOBER
1998-MAY 1999**

Appendix F
(overhead)

**Proposed Short-term Action Plan for Implementing a Community Focused
Measles Control Strategy, October 1998-May 1999**

Immediate Priorities

- 1 Establish a foundation for controlling and monitoring measles
- 2 Develop, implement, and document a sustainable strategy for controlling measles
- 3 Urban measles control

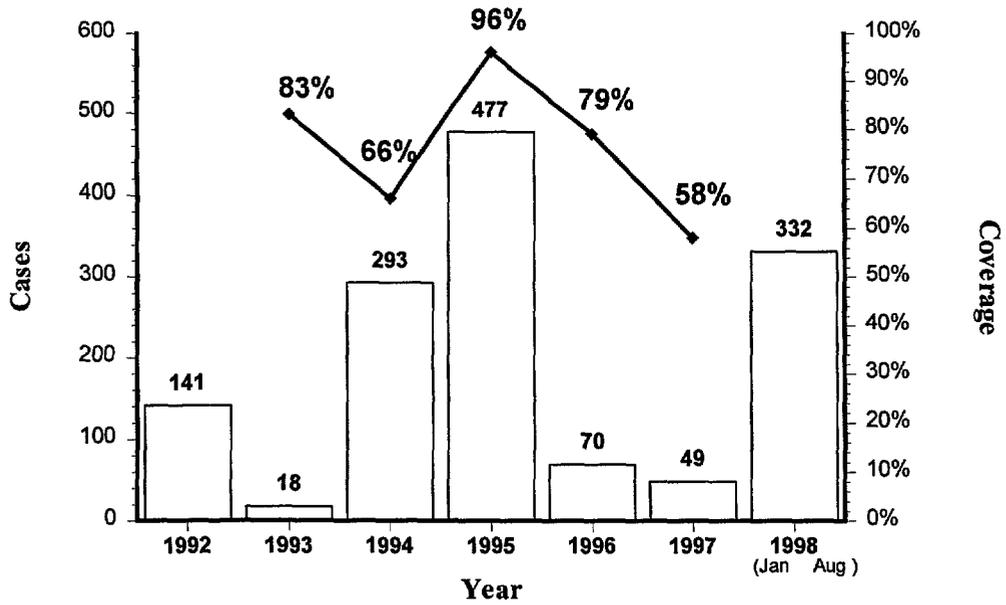
Characteristics

- low cost approach for improving community awareness about the importance of immunization, measles disease (neighborhood committees, CHWs, etc),
- finding and immunize defaulters (patient registers, any household visits),
- finding and immunize risk groups (CIDs if necessary), and
- using HMIS data to actively monitor measles locally (surveillance)

APPENDIX G

**MEASLES CASES AND MEASLES IMMUNIZATION, KALABO
DISTRICT, 1992-1998**

Measles cases and measles immunization, Kalabo District, Zambia, 1992 - 1998



Source CBOH Zambia