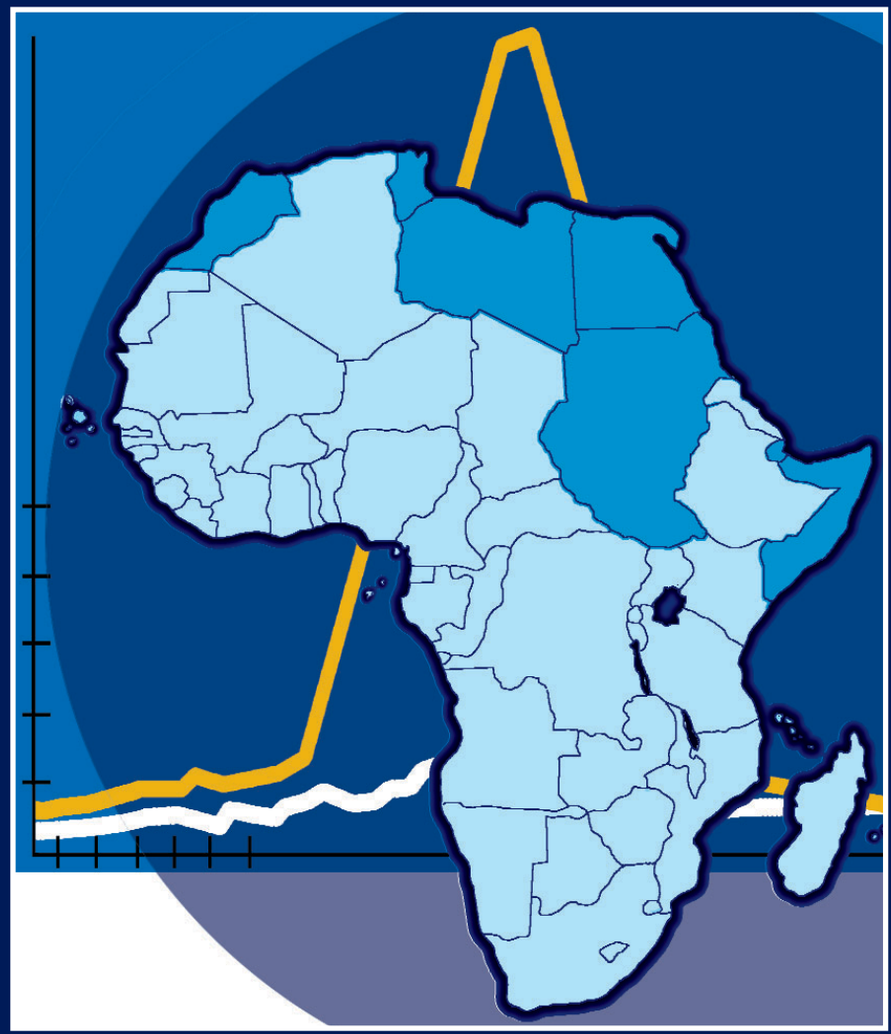
DISTRICT ANALYSIS BOOK

A Module of the Technical Guidelines for Integrated Disease Surveillance and Response in the African Region



WORLD HEALTH ORGANIZATION
Regional Office for Africa

CDC
Centers for Disease Control and Prevention

November 2003

This document was prepared by WHO Regional Office for Africa (AFRO), Harare, Zimbabwe, in collaboration with the Centers for Disease Control and Prevention (CDC), Atlanta, USA, and supported by USAID.

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We gratefully acknowledge the contributions of the following organizations within WHO and CDC:

World Health Organization (WHO)
Division of Communicable Disease Surveillance and Response (CSR)

World Health Organization Regional Office for Africa (WHO/AFRO)
Division of Prevention and Control of Communicable Diseases
- Communicable Disease Surveillance and Response (CSR)
- Vaccine Preventable Diseases (VPD)
- Tuberculosis Control Programme (TUB)
- Other Tropical Disease Control Programme (OTD)
- Leprosy Control Programme (LEP)
- Integrated Management of Childhood Illnesses Programme (IMCI)
- Regional Programme on AIDS (RPA)
- Roll Back Malaria/Malaria Control Programme (RBM/MAL)

Centers for Disease Control and Prevention (CDC)
Epidemiology Program Office
- Division of International Health

National Center for Infectious Diseases
- Division of Bacterial and Mycotic Diseases
  - Meningitis and Special Pathogens Branch
  - Foodborne and Diarrhoeal Diseases Branch
- Division of Parasitic Diseases
- Division of Vector-borne Infectious Diseases

National Center for HIV, STD, and TB Prevention
- Division of HIV/AIDS Prevention, Surveillance and Epidemiology
- Division of Sexually Transmitted Disease Prevention
- Global AIDS Program

National Immunization Program
- Global Immunization Division

Office of Global Health

Cover design by: Diane Speight
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HEALTH FACILITIES AND DISTRICT TEAMS SHOULD ROUTINELY:

- Analyze the routine summary data for priority diseases that are reported to the district.
- Record the summary totals for each priority disease on a table and plot the total on the line graph.
- Observe trends on the line graph to see if they are increasing, decreasing or staying the same.
- Interpret the trends and refer to the technical guidelines for appropriate disease control and response actions.

ANALYZE THE DATA

Each month or quarter:

Analyze the inpatient and outpatient data for each disease separately. In-patients are more likely to have severe disease, and the diagnosis is often more accurate. Many disease control programs have objectives to reduce severe cases and deaths. Thus, information from analysis of inpatient data is more accurate for evaluating whether the disease control program is working.

1.1 Review the updated graphs and tables and make sure they are complete and up-to-date.

1.2 Compare the current information for each priority disease with previous months, seasons, or years.

1.3 Decide if:

- The number of cases and deaths for each disease is the same, higher or lower than in previous months, seasons, or years.
- The case fatality rate is the same, higher or lower than in previous months, seasons or years.
- An action threshold has been reached that requires immediate action. Refer to the national technical guidelines for integrated disease surveillance for disease-specific action thresholds.

1.4 Consider non-disease reasons for any increase or decrease in the data. For example, is the increase or decrease due to:

- A new health facility or hospital has opened in the catchment area resulting in a change in referral patterns.
- New clinicians in the area are using different diagnostic criteria or case definitions.
- Data recording errors.
- A change in the number of health facilities reporting information.
- A seasonal variation.
- A change in screening or treatment programs that accounts for an increase in the number of people seeking care.
- A recent immigration or emigration or increase in refugee population.
- A change in the quality of services being offered at the health facility. For example, drugs are reliably available, lines are shorter, health workers are more helpful.

1.5 Refer to disease-specific considerations to interpret any increase or decrease in the data. Also refer to the national technical guidelines for integrated disease surveillance and response.

MALARIA

MALARIA CASES AND DEATHS

Introduction

- Malaria can kill 5% of all children <5 years old and is often responsible for 25% of all child deaths.
- 70-90% of children who die from malaria come to a health facility during their final illness episode.
- In intense transmission districts, 70-80% of the <5 year-old malaria mortality is due to anemia. Most severe-anemia-related deaths occur between 9 months and 24 months.
- The hospital case fatality rate is often 10-40% and most deaths occur within 24 hours of admission. The target case fatality rate in hospitals should be 3-4%.

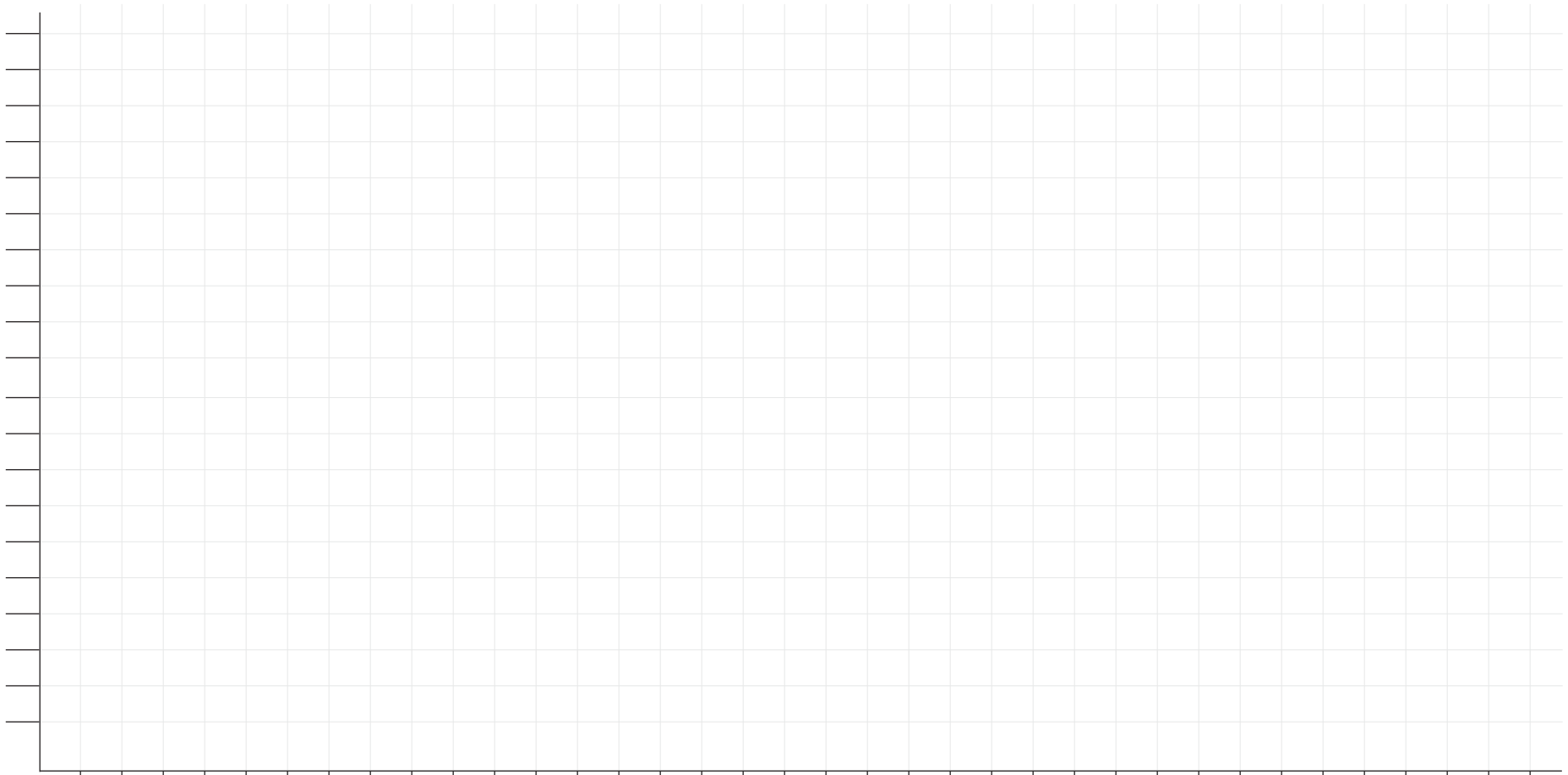
Analysis of time, place, and person. Insecticide treated nets and adequate treatment of malaria cases are highly effective in decreasing child deaths due to malaria.

- In-patient malaria cases and deaths, and in-patient malaria cases and deaths with severe anemia should decline by >50%.
- Out-patient malaria cases should decline by at least 30%. A decline for out-patient malaria cases is more difficult to achieve than in-patient cases and deaths because only approximately 50% of the illnesses diagnosed as malaria among out-patients are truly due to malaria.
- Lab-confirmed out-patient malaria cases should decline by >50%. When interpreting trends in laboratory-confirmed cases, consider the number of persons tested. For example, if supplies for lab tests run short for several months, then a declining trend may be an artifact and not represent a true decline in malaria cases.
- If the trend in in-patient malaria cases and deaths (including in-patient malaria cases and deaths with severe anemia) is not declining, then the district team should review the coverage and effectiveness of all the malaria program components in the district.
- The district team must consider several other factors that may cause the trend to not decline: increase in community referral due to improved community aspects of the Integrated Management of Childhood Illnesses (IMCI) program, improved availability of affordable drugs at the health facilities, improved health facility quality (shorter lines, friendlier staff, etc.), seasonal variation after rainy season, increasing drug resistance, or change in health workers or health worker diagnosis, or an increase in malaria-like fever-causing illness.
- Since most of the malaria and severe anemia deaths occur in children <5 years old, trends in the <5 year old malaria cases and deaths should be followed the closest.

Public health action and targets. A district malaria program should be comprised of the following components covering the whole district:

- Early recognition and treatment of malaria/fever cases at home and at the community level
- Promotion of use of insecticide treated mosquito nets (ITNs) and other insecticide treated materials
- Chemophylaxis/intermittent malaria treatment in pregnancy
- Indoor residual spraying where applicable
- Integrated management of the environment
- Quality case management at the health facility level: early diagnosis, prompt and appropriate treatment of malaria cases at health facility
- Forecasting, early detection, prevention, and control of epidemics (in applicable districts)
- Ensuring availability of drugs, equipment, and supplies
- Health promotion

Reported <5 Years Old In-patient Malaria Cases and Deaths by Month _____ - _____



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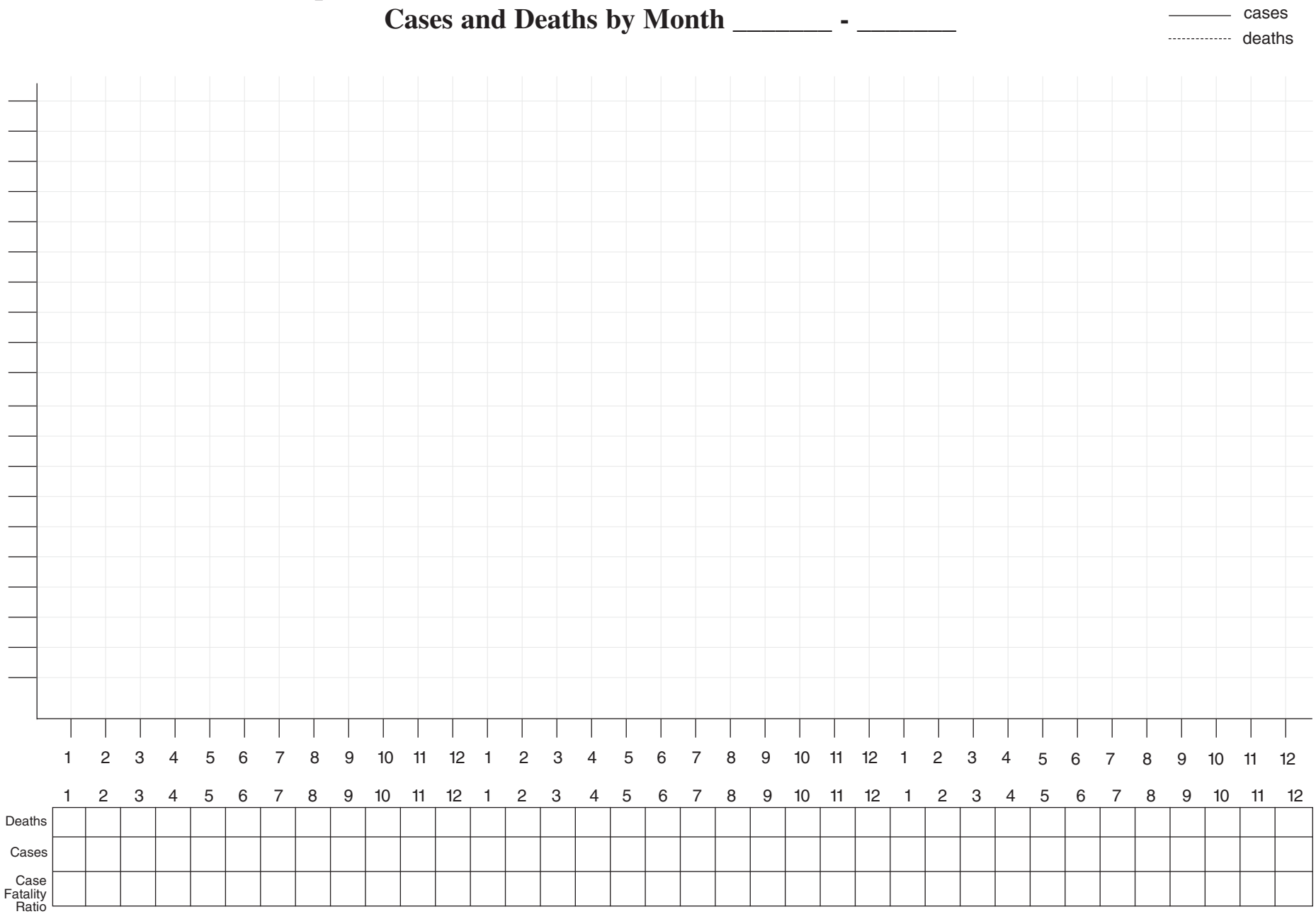
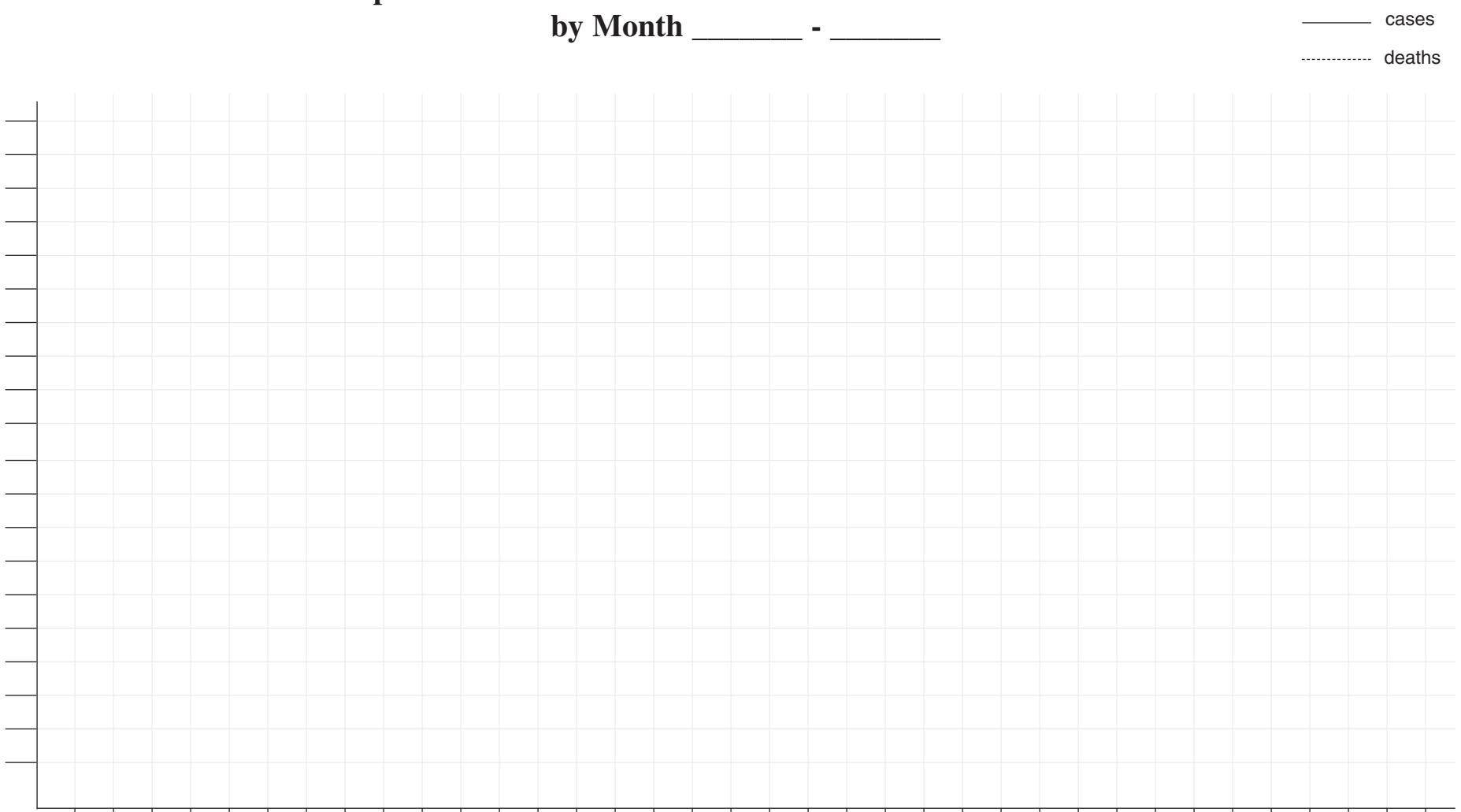
Deaths																																				
Cases																																				
Case Fatality Ratio																																				

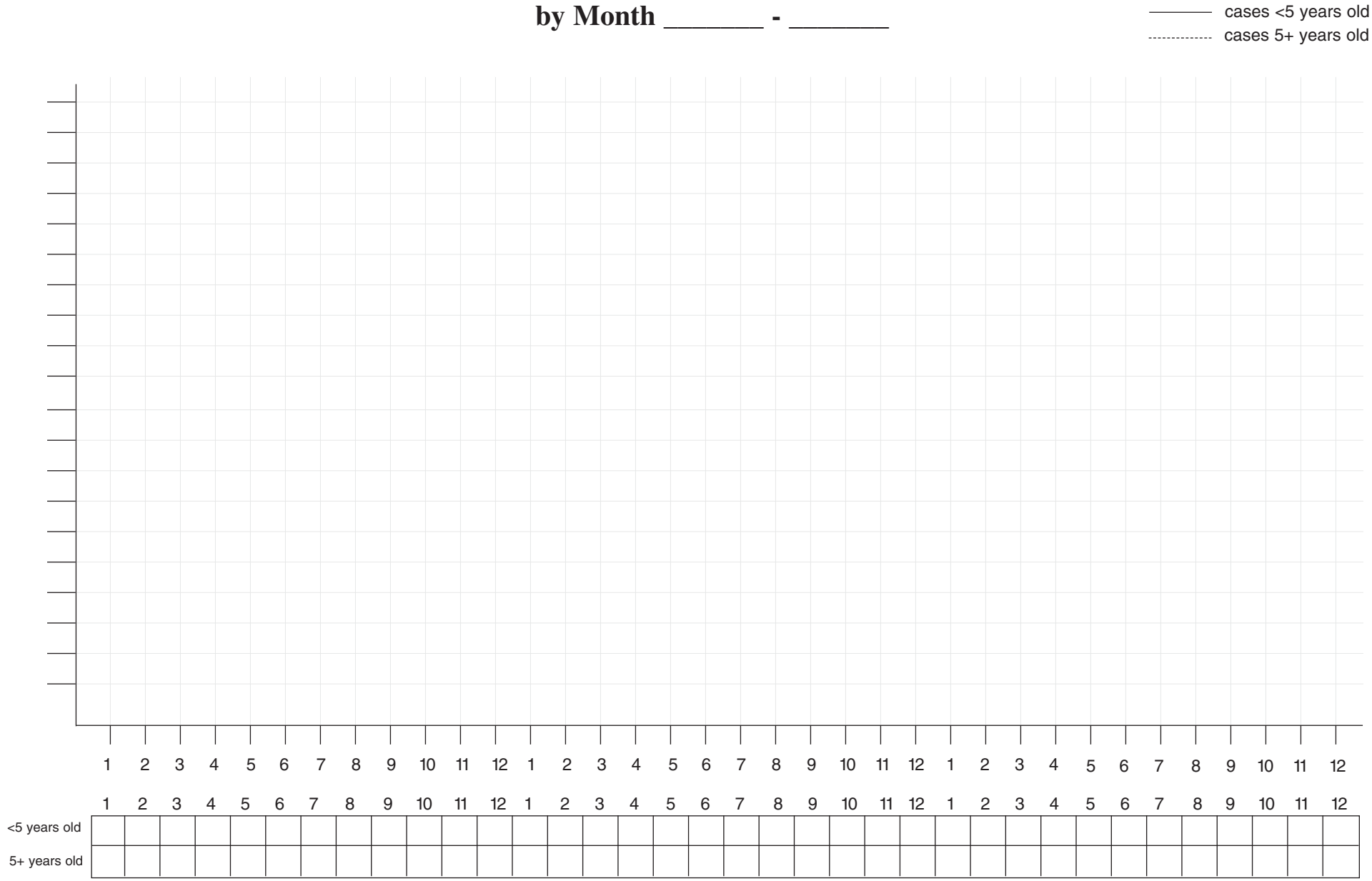
Reported <5 Years Old In-Patient Malaria with Severe Anaemia
Cases and Deaths by Month _____ - _____



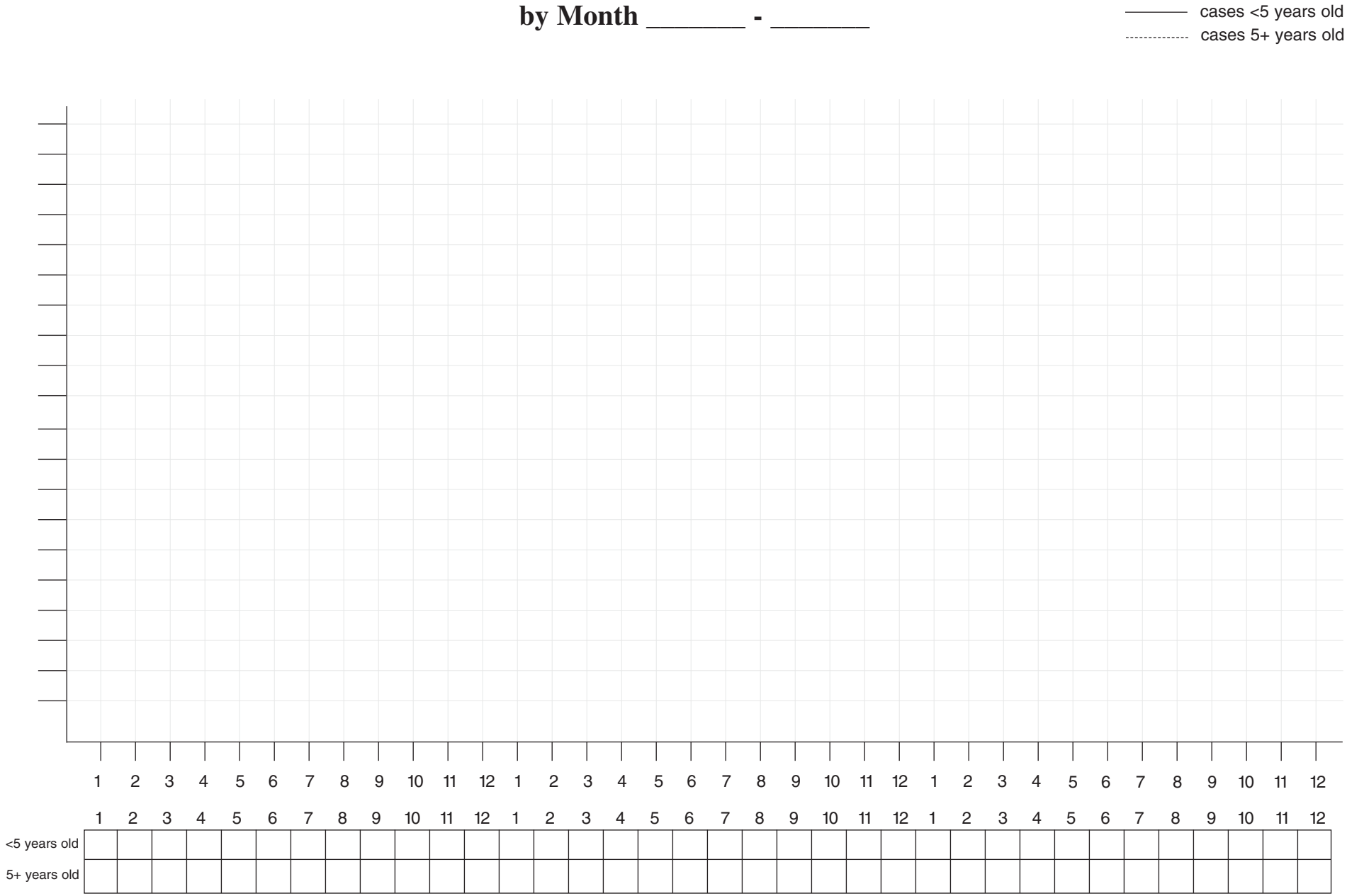
Reported 5+ Years Old In-Patient Malaria Cases and Deaths by Month _____ - _____



Out-Patient Uncomplicated Malaria Cases
by Month _____ - _____



Reported Lab-Confirmed Out-Patient Uncomplicated Malaria Cases
by Month _____ - _____



<5 YEAR OLD PNEUMONIA

<5 YEAR OLD PNEUMONIA

Introduction

- Pneumonia can kill up to 5% of all children <5 years old and is often responsible for 25% of all child deaths.
- The IDS pneumonia surveillance definitions are based on the Integrated Management of Childhood Illnesses (IMCI) classification system. Therefore, all clinicians in the district must record classifications for "pneumonia" and "severe pneumonia" in their out-patient registers for monthly counting of cases.
- A high incidence or increasing incidence of HIV in the district may complicate the interpretation of <5 year-old pneumonia surveillance data since childhood pneumonia cases and deaths will increase with high or increasing HIV incidence.
- In the absence of high or increasing incidence of HIV, severe cases of pneumonia and pneumonia deaths should be reduced by 50% from their current high levels by the proper functioning of the health facility and community components of IMCI throughout the district.
- After *Haemophilis influenzae* type b and *Streptococcus pneumoniae* vaccines are introduced into district immunization programs, many mild pneumonia cases, as well as severe cases and deaths and severe cases, should be prevented.

Analysis of time, place, and person.

- In districts without high or increasing HIV, the following categories of < 5 year old pneumonia cases should decline:
  - ▸ Out-patient severe pneumonia cases
  - ▸ In-patient pneumonia deaths
  - ▸ In-patient pneumonia cases
- The number of out-patient (non-severe, mild) pneumonia cases may not decline since IMCI interventions are not targeting prevention of mild pneumonia cases.

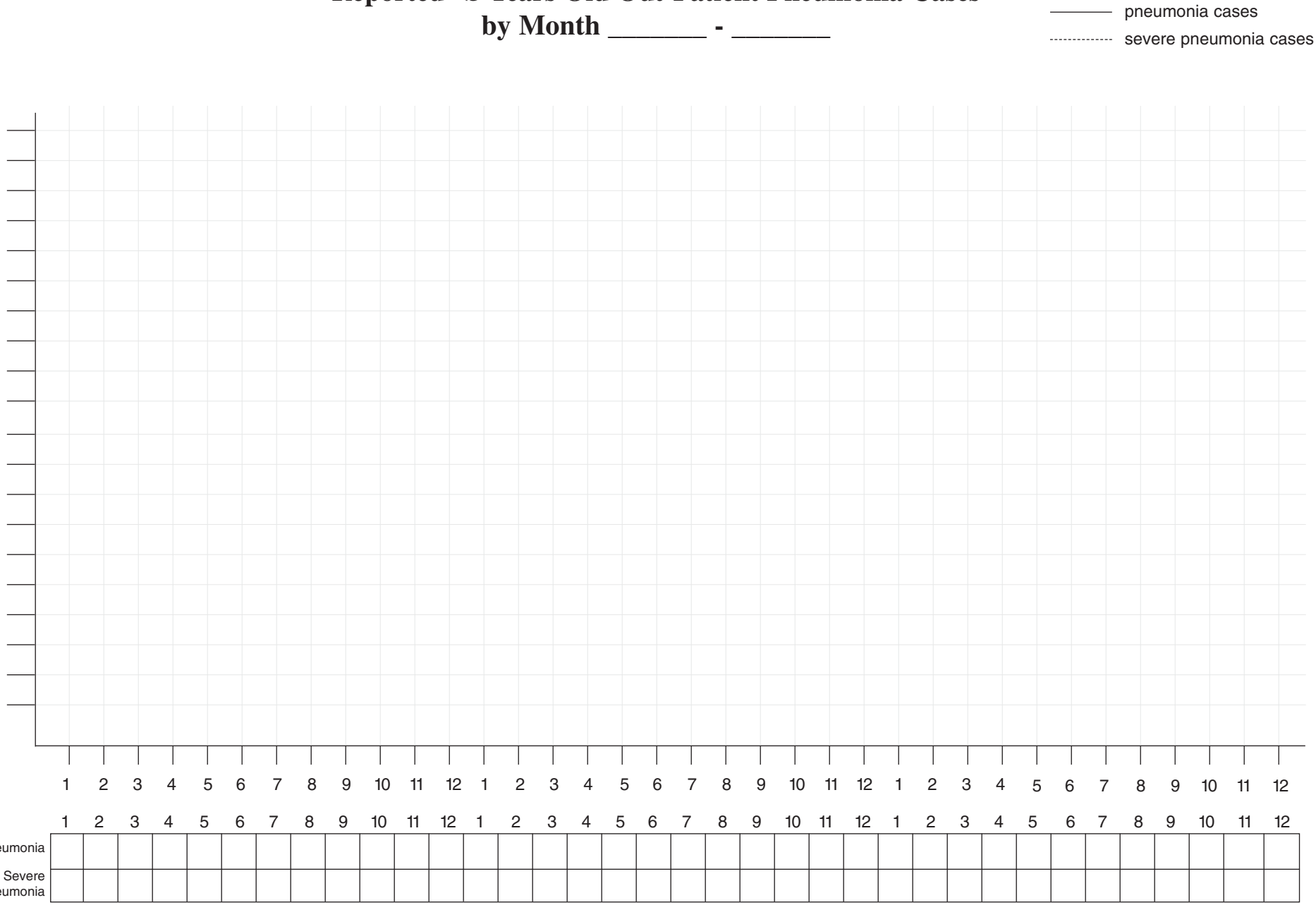
Public health action and targets.

- WHO and UNICEF advocate that each district team use the Integrated Management of Childhood Illnesses (IMCI) strategy to address <5 year old pneumonia mortality. The main program elements of IMCI related to pneumonia are:
  - ▸ Education of parents and communities about prompt referral for children with general danger signs, fever, and fast or difficult breathing
  - ▸ Follow the health workers' advice about treatment, follow-up and referral
  - ▸ Effective treatment of children <5 years old with pneumonia at health facilities
  - ▸ Prompt and appropriate referral of children classified as severe pneumonia from health facilities to a hospital
  - ▸ Appropriate in-patient management of children with pneumonia in hospitals

Reported <5 Years Old In-Patient Pneumonia Cases and Deaths by Month _____ - _____

	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Deaths																																				
Cases																																				
Case Fatality Ratio																																				

Reported <5 Years Old Out-Patient Pneumonia Cases by Month _____ - _____



<5 YEAR OLD DIARRHEA

<5 YEAR OLD DIARRHEA

Introduction

- Diarrhea can kill up to 5% of all children <5 years old and is often responsible for 20 to 25% of all child deaths.
- The IDSR diarrhea surveillance definitions are based on the Integrated Management of Childhood Illnesses (IMCI) classification system. Therefore, all clinicians in the district must record both "some dehydration" and "severe dehydration" in out-patient registers for monthly counting of cases.
- In-patient child diarrhea deaths (persistent diarrhea, nutrition-related, HIV, and so on) can be caused by dehydration and non-dehydration-related mechanisms.

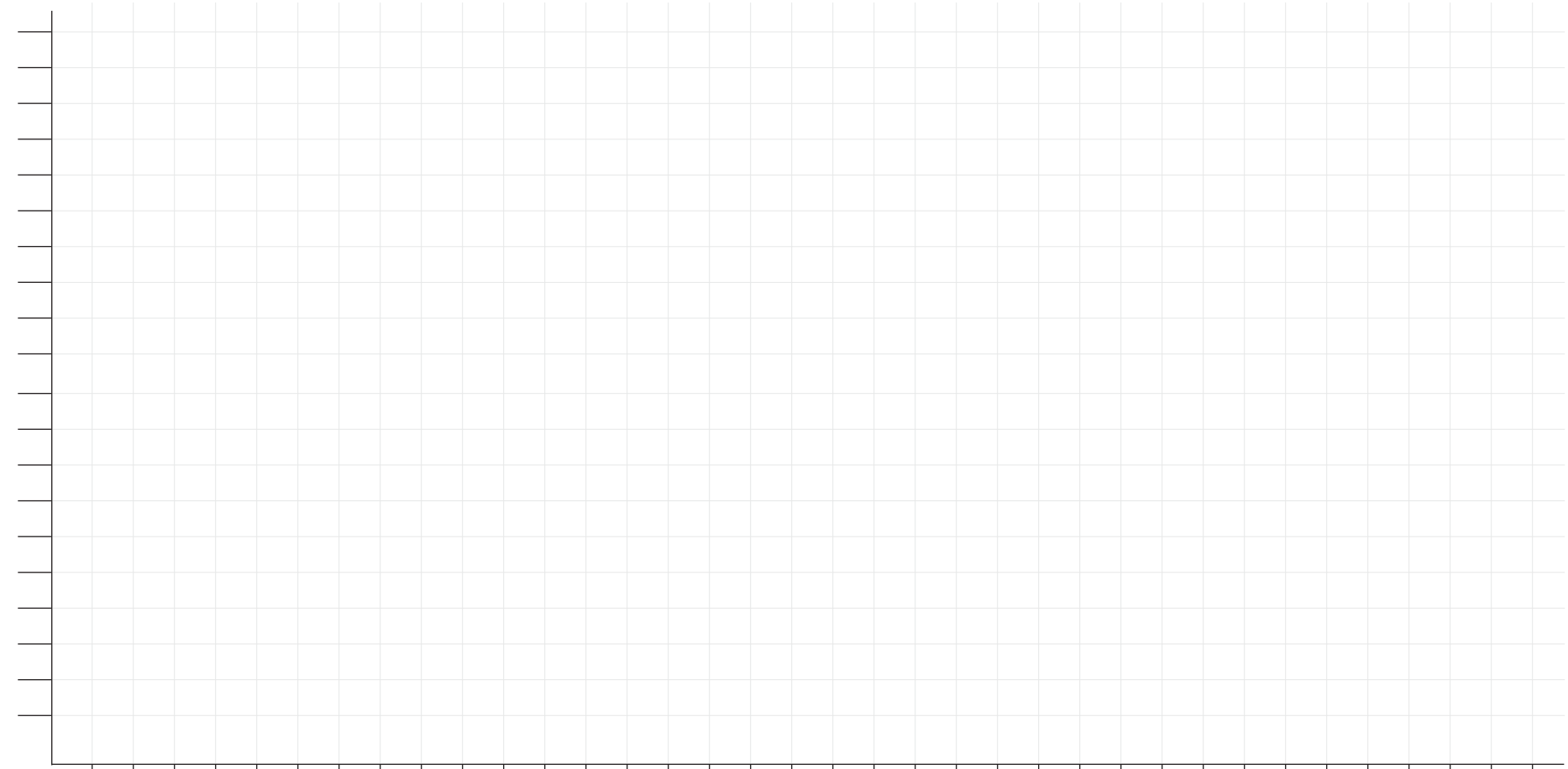
Analysis of time, place, and person.

- When good community and health facility IMCI components are in place, trends in <5 diarrhea with dehydration cases should decline.
  - ▸ If there is a strong IMCI program with a good community component that includes community-based home-fluids and IMCI diarrhea prevention, the trend in cases of diarrhea with some dehydration might initially increase, but the trend will ultimately decline.
  - ▸ Out-patient "severe" diarrhea dehydration should decline by at least 50% if there are good community and health facility components of IMCI.
  - ▸ In-patient diarrhea cases should decline by at least 50% if there are good community and health facility components.
  - ▸ In-patient diarrhea deaths should decline if there are good health facility and community IMCI components, including good management of persistent diarrhea, adequate breastfeeding, and child food and water sanitation. Trends in hospitalized diarrhea deaths may show less reduction since approximately 50% of diarrhea deaths are related to persistent diarrhea. Preventing persistent diarrhea deaths will require early recognition and specific nutritional interventions as promoted by IMCI. In addition, HIV may cause some deaths in <5 year old children that may be classified as diarrhea deaths. HIV may have some effect on the number of persistent diarrhea cases.

Public health action and targets.

- Both WHO and UNICEF recommend that health facilities in all districts follow the Integrated Management of Childhood Illnesses (IMCI) guidelines. The main program elements are:
  - ▸ Education of parents and communities about prompt prevention of dehydration in children with diarrhea by giving home fluids
  - ▸ Education of parents and communities about the danger signs that prompt referral to health facilities
  - ▸ Education of communities about prevention of diarrhea through clean food and water
  - ▸ Effective treatment of children with dehydration at health facilities

Reported <5 Years Old In-Patient Diarrhea Cases and Deaths by Month _____ - _____



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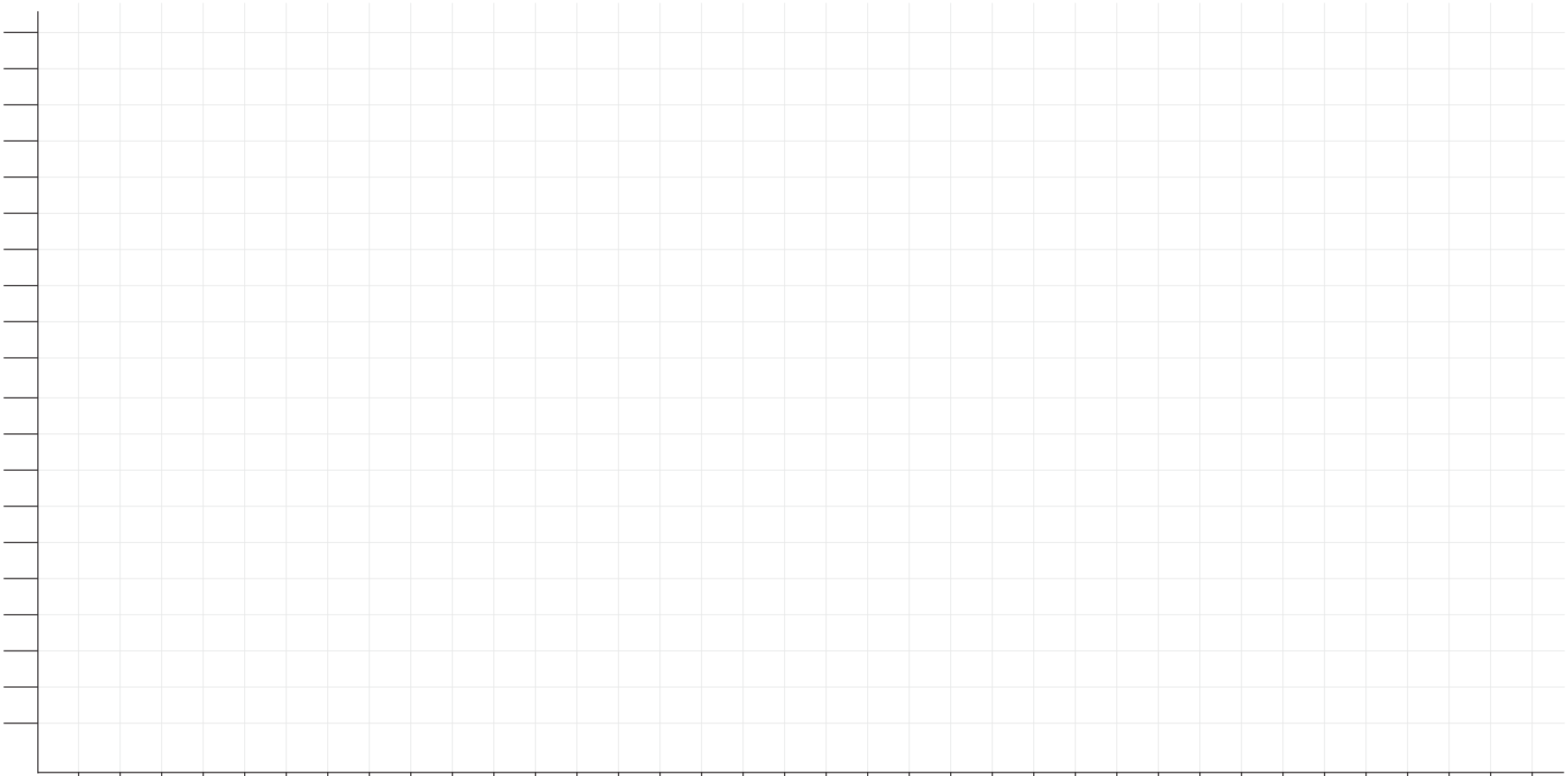
Deaths																																				
Cases																																				
Case Fatality Ratio																																				

Reported <5 Years Old Out-Patient Diarrhea Cases by Month _____ - _____



CHOLERA

CHOLERA

Introduction

- The surveillance objective for cholera is to detect cholera outbreaks promptly while they are small, improve early case detection, and use adequate case management to limit deaths.

Laboratory analysis

- Cholera organisms are not as fragile as *Shigella* organisms. In an outbreak due to cholera, if the lab reports back to the district that 5 to 10 specimens arrive at the lab in good condition, there is a near 100% chance of isolating *Vibrio cholerae* from at least one of the specimens. The lab is especially helpful when there are just a few cases in the district. When there are hundreds of cases, especially in adults with typical rice water stools along with adult deaths, the outbreak should be considered due to cholera until proven otherwise.

Analysis of time, place, and person.

- Over the 3-year time period on the graph, lab-confirmed cholera cases and cholera outbreaks should decline dramatically. With the collaboration of political leaders and communities in supporting food and water sanitation, there should be nearly zero cholera cases.
- Making maps of cases by village or precise location by date of health facility visit or onset of illness will help determine the direction of spread and other characteristics of the outbreak. Cholera outbreaks from a common source of water or food (funerals, water supply) may be identified by careful analysis of precise maps of cases and deaths.
- The case fatality from cholera outbreaks should be limited to 1% or less. Case fatality rates >1% indicate problems with case identification and prompt and adequate case management.

Public health action and targets.

- The public health prevention target is to prevent all cholera outbreaks since cholera can be completely prevented by adequate food and water sanitation. A cholera outbreak indicates inadequate food and water sanitation in the district. An adequate analysis of time, place, and person risk factors of cholera cases and outbreak can help terminate an existing cholera outbreak and prevent future cases and outbreaks.

Reported Total In-Patient and Out-Patient Cholera Cases and Deaths by Month _____ - _____

DIARRHEA WITH BLOOD

DIARRHEA WITH BLOOD

Introduction

- The surveillance objective is to detect *Shigella dysenteriae* type 1 outbreaks promptly and perform antibiotic resistance testing quickly to determine the appropriate antibiotic to use to effectively treat patients.
- Trends in diarrhea with blood cases and especially deaths are used as the basis for detecting outbreaks due to *Shigella dysenteriae* type 1 (SD1). If an increase in diarrhea with blood cases or deaths occurs, lab analysis of stool specimens is used to determine if the increase is truly due to SD1.
- *Shigella dysenteriae* type 1 can be resistant to multiple antibiotics and can have a high fatality rate.

Laboratory analysis

- *Shigella* organisms are fragile. If specimens are not put in Cary-Blair transport media or are not directly cultured within one hour of collection, isolation of *shigella* organisms is unlikely.
- If stool specimens are placed in Cary-Blair transport medium and delivered to the lab within three days, there is a near 100% chance of isolating SD1 from at least one of the five specimens if the specimens are from patients in a true SD1 outbreak.

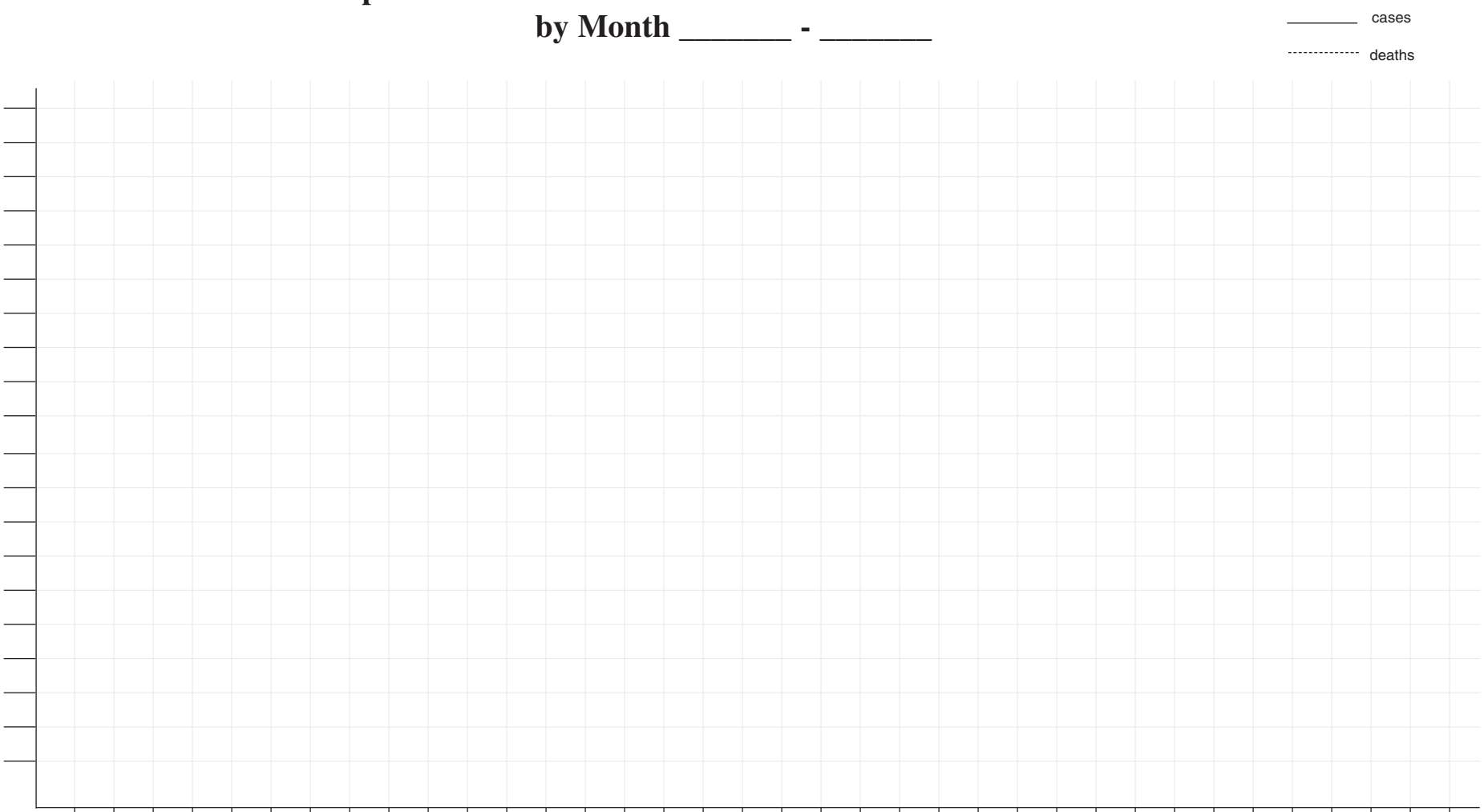
Analysis of time, place, and person.

- A SD1 outbreak should be suspected if the trends show an unusual increase in diarrhea with blood cases or deaths. This should trigger stool collection to attempt isolation of the organism.
- Even a small increase in diarrhea with blood **deaths** should trigger a lab-based suspected outbreak investigation and collection of stool specimens.
- If the outbreak of diarrhea with blood continues and the stool specimens were transported to the lab in good condition and were negative, national-level epidemiologists and lab experts should be requested to determine the etiology of the outbreak. In districts at risk for viral hemorrhagic fever (VHF), diarrhea with blood deaths should trigger consideration of VHF.
- *Shigella dysenteriae* type 1 outbreaks from a common source of water or food (funerals, water supply) may be identified by careful analysis of precise maps of cases and deaths.
- Age distribution of cases and deaths is important, especially because the case fatality rate can be very different by age (very young and old persons have the highest case fatality). Case fatality rates by age group may lead to public health messages about faster case detection and treatment in those age groups, especially among household or intimate contacts of diarrhea with blood cases.

Public health action and targets.

- SD1 outbreaks should not be occurring in districts since SD1 outbreaks can be completely prevented by adequate food and water sanitation and good handwashing practices. A SD1 outbreak indicates inadequate food and water sanitation in the district.

Reported In-Patient Diarrhea with Blood Cases and Deaths by Month _____ - _____



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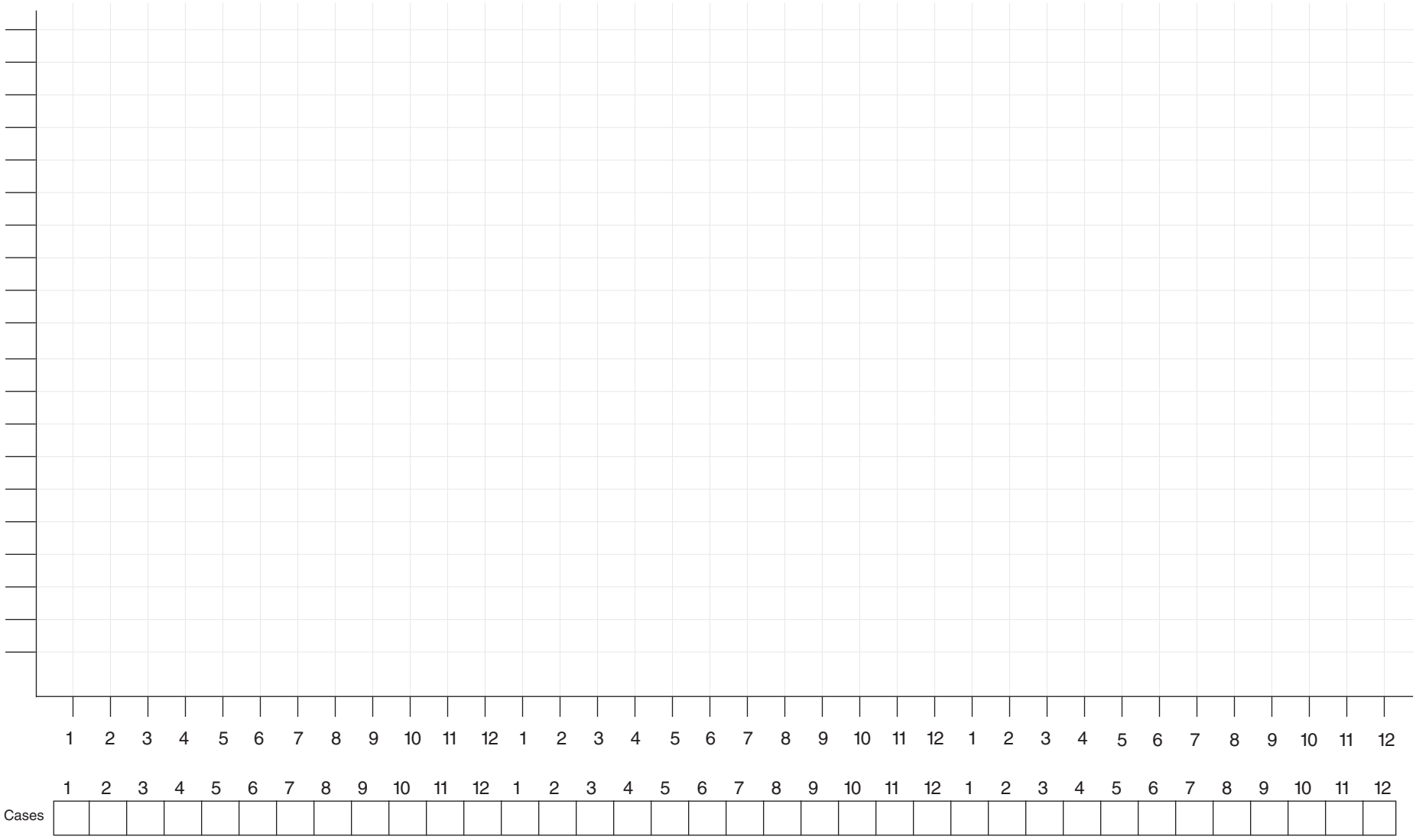
Deaths																																				
Cases																																				
Case Fatality Ratio																																				

Reported Out-Patient Diarrhea with Blood Cases by Month _____ - _____

_____ cases



MEASLES

MEASLES

Introduction

- These guidelines are appropriate only for measles surveillance in districts or countries in which an <15 year old national measles mass campaign has already been conducted.
- Implementation of an <15 year old campaign with high routine coverage (>80%) results in near zero measles deaths and few true measles cases. Within two months of the end of the national <15 year old measles mass campaign, >95% of the reported measles cases will not be true measles cases. Follow-up campaigns in children <5 years old every 3-5 years maintain measles deaths at near zero.

Laboratory analysis

- A serum specimen should be collected on all reported measles cases (unless there is a large outbreak--for example, >10 reported cases in district in a month). A single isolated measles IgM positive case can occur. The isolated measles IgM positive case can be a false positive, true isolated measles case, or a case that is measles IgM antibody positive due to recent measles vaccination (within 30 days). During day 1 after rash, 30% of children are measles IgM negative, but by day 4, all true measles cases are positive for measles IgM antibody. The measles IgM antibody test can be positive for 30 days after measles vaccination.

Analysis of time, place, and person.

- After the <15 year old campaign, almost all serum samples will be negative for measles IgM antibody.
- If 5 measles cases in a district in a month are measles IgM positive, there is potential measles virus circulation, and an outbreak investigation should be done. The outbreak investigation should include a village-level investigation for additional unreported cases and include collecting additional blood specimens on previously unreported suspected measles cases. If after a village-level search, only 1-2 measles IgM positive cases are detected, then the outbreak was not significant. However, if there are 3 to 5 or more IgM positive cases, then an outbreak investigation should take place to determine the cause of the outbreak. Possible causes are the following:
    - ▸ Circulation of measles in persons 15+ years old
    - ▸ Low coverage during the mass campaign
    - ▸ Follow-up <5 year old campaign delayed >3-5 years after the previous campaign
    - ▸ Low routine coverage

Public health action and targets.

- Every district can reduce measles deaths to zero by achieving high routine coverage and high coverage <15 year old supplemental immunization activity. Zero measles deaths can be maintained with periodic follow-up campaigns in children <5 years old every 3-5 years. An outbreak of measles in the district after the initial campaign indicates a weakness of the mass campaign or low routine coverage.

Reported Total In-Patient and Out-Patient Measles Cases by Month _____ - _____

_____ Confirmed cases (lab or epidemiologic linkage to a lab confirmed case).

---------- Total suspected cases.

1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

Confirmed cases*	
Total suspected cases	

*(lab or epidemiologic linkage to a lab confirmed case)

MENINGITIS

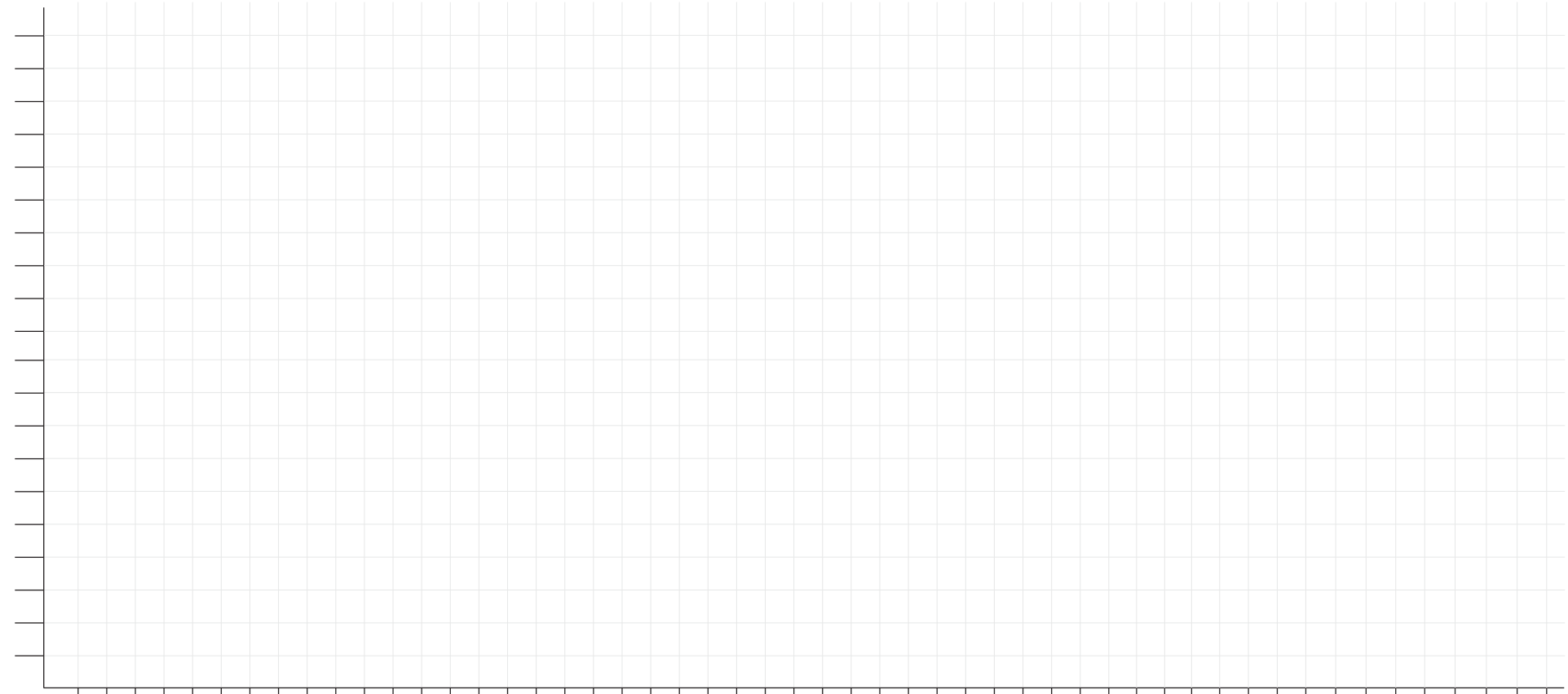
MENINGITIS

Introduction

- District team should identify an alert and an action (or epidemic) threshold. The alert threshold is the number of meningitis cases per week that would signify a suspected outbreak in the district and in each health facility. A dotted line can be drawn on the graph to show the alert threshold that signifies there is potential for a suspected outbreak.
- WHO recommendations for detection of meningococcal outbreaks in meningitis-belt countries were revised in September 2000.
  - Two thresholds are recommended: 1) alert threshold, 2) epidemic threshold.
  - The alert threshold is used to: 1) sound an early warning and launch an investigation, 2) check outbreak preparedness, 3) start a vaccination campaign if there is an outbreak in a neighboring area, and 4) prioritize areas for vaccination campaigns in the course of an epidemic.
  - The epidemic threshold is used to confirm the emergence of an epidemic so as to step up control measures, i.e. mass vaccination and appropriate case management.
  - **The alert threshold is 5 reported meningitis cases per 100 000 inhabitants per week for districts with a population of >30 000 and 2 cases in 1 week for districts with populations <30 000 inhabitants.**
  - The epidemic threshold is the following:
    - For districts with >30 000 inhabitants:
      - For districts with no outbreak for 3 years and meningococcal vaccination coverage <80% or alert threshold crossed early in the dry season (Dec to Feb in Sahel), 10 reported cases per 100 000 inhabitants per week.
      - For all other situations, 15 cases per 100 000 inhabitants per week.
    - For districts with <30 000 inhabitants:
      - 5 cases in 1 week, or
      - Doubling of number of cases over 3 weeks (for example, 1 case in first week, 2 cases in the second week, and 4 cases in the third week), or
      - Other situations on a case-by-case basis (for example, 2 confirmed cases in 1 week are enough to start vaccination in refugees, displaced persons, or mass gatherings).
  - If the alert threshold is reached, the following action should be taken: inform authorities, conduct an investigation, confirm with lab testing, treat cases, strengthen surveillance, and prepare for a vaccination campaign.
  - If the epidemic threshold is reached, the following action should be taken: begin mass vaccination, distribute treatments to health centers, treat cases according to guidelines adapted for use during epidemics, and inform the public.
  - References: *Weekly Epidemiologic Record*, No. 38, 22 September 2000.
- Districts in non-meningitis-belt countries may want to use thresholds appropriate for their country. They can use threshold guidelines used for other diseases: for example, “any unusual increase in reported cases and at least by the time a two fold increase has occurred.”

Immediately-Reported Meningitis Cases by Week to Detect N. Meningiditis Outbreaks in High-Risk Districts

District team should identify an alert threshold designating some number of meningitis cases per week that would signify a suspected outbreak in the district. (In many cases, districts use an alert threshold of 5 cases per 100,000 population per week.) In this district, the alert threshold is _____ per _____ population per week. Meningitis belt countries may want to number the weeks in the graph below according to the outbreak period.



WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Deaths																																																					
Cases																																																				
Case Fatality Ratio																																																		

SEXUALLY TRANSMITTED INFECTIONS

SEXUALLY TRANSMITTED INFECTIONS

Introduction

- The surveillance objective for routine surveillance of sexually transmitted infections (STI) is to do surveillance in all health facilities for the syndromes of male urethral discharge and male and female non-vesicular genital ulcers. An added benefit of STI surveillance is that surveillance of male urethral discharge and genital ulcers can be used as indicators of unsafe sexual behavior and potential for HIV transmission. Male urethral discharge is caused mainly by *Neisseria gonorrhoea* and *Chlamydia trachomatis*. The clinical syndrome of male urethral discharge is closely correlated with lab-proven *Neisseria gonorrhea* and *Chlamydia trachomatis*. Although these two organisms do not cause much long-term morbidity in males, in women these two organisms cause pelvic inflammatory disease, which often leads to infertility, ectopic pregnancy, and chronic pelvic pain.
- Genital ulcers in males and females are caused primarily by syphilis and chancroid although several countries are now reporting increasing numbers of herpes simplex virus type 2. Syphilis can cause long-term effects (neurosyphilis, aortic syphilis, congenital syphilis), but in African districts a main effect of both syphilis and chancroid is to facilitate HIV transmission. The clinical syndrome of male non-ulcerative genital ulcer is moderately related to lab-confirmed syphilis and chancroid. The clinical syndrome of female non-ulcerative genital ulcer is also moderately related to lab-confirmed syphilis and chancroid but less so than for male non-ulcerative genital ulcers.

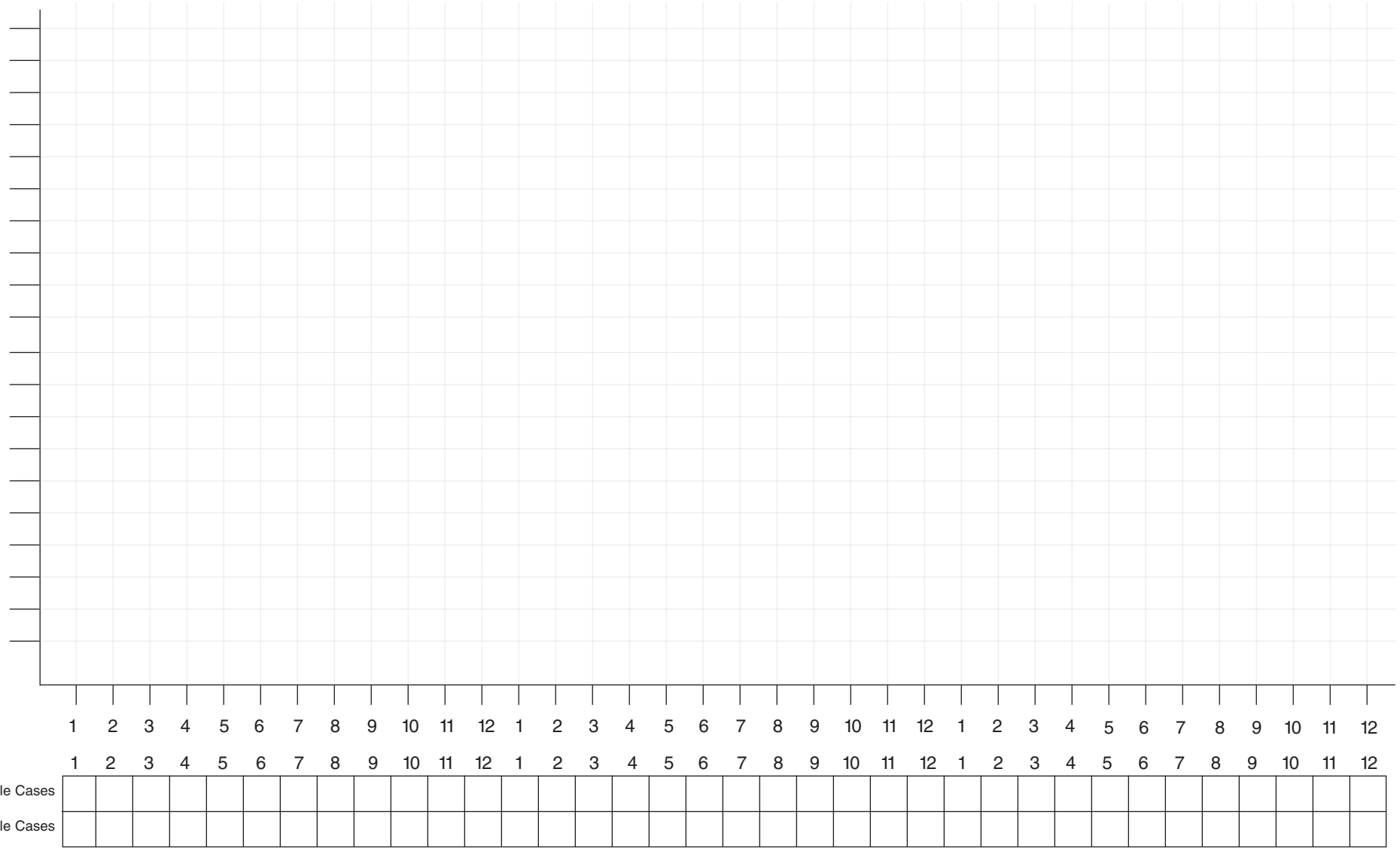
Time trend analysis

- Because of the social factors associated with the STIs (for example, social or cultural stigmas), changes in trends in STIs are often related to reporting factors rather than to true changes in disease incidence. An increase in number of cases might be due to new private or STI clinic starting to report STI cases, a new STI clinic opening, change in diagnosis patterns by new clinicians, increase in drug availability, or an increase in drug resistance. A decrease in the number of cases may be due to an increase in STI patient attendance at private clinics that do not participate in surveillance reporting, decrease in drug availability, increase in cost of services, including drugs, or effective district-wide STI program activities.

Public health action.

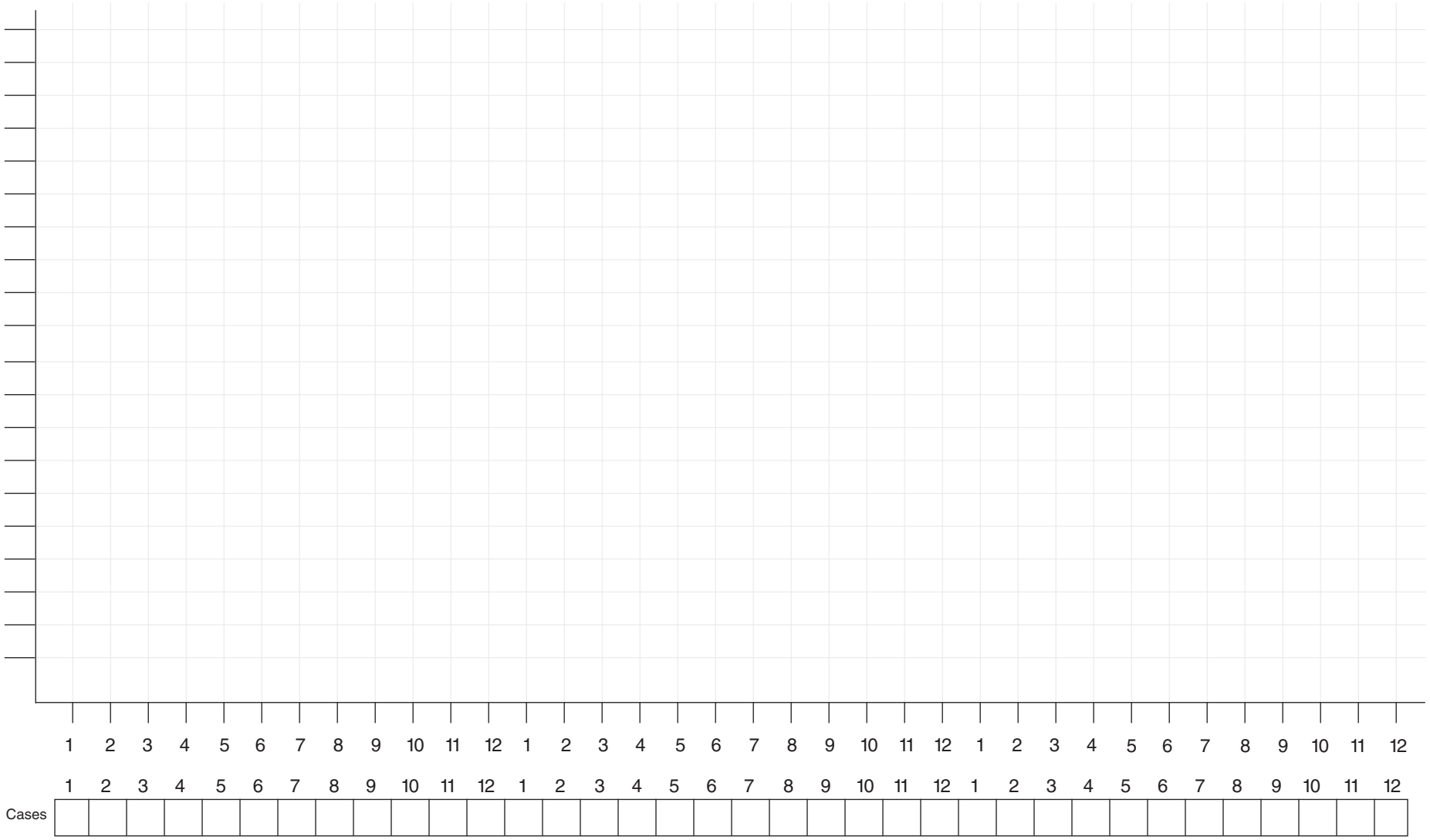
- Activities that the district can promote to decrease STIs and HIV include: delayed onset of sexual activity, protected intercourse with condoms, control of STIs in sex workers, reducing the number of sex partners, and prompt and effective treatment of STIs and their contacts.
- Evidence has shown that declines of cases of male discharge by 50% and non-vesicular genital ulcers by 50% can be achieved in many districts over several years.

Male and Female Non-Vesicular Genital Ulcer Cases by Month _____ - _____



Male Urethral Discharge Cases
by Month _____ - _____

_____ cases



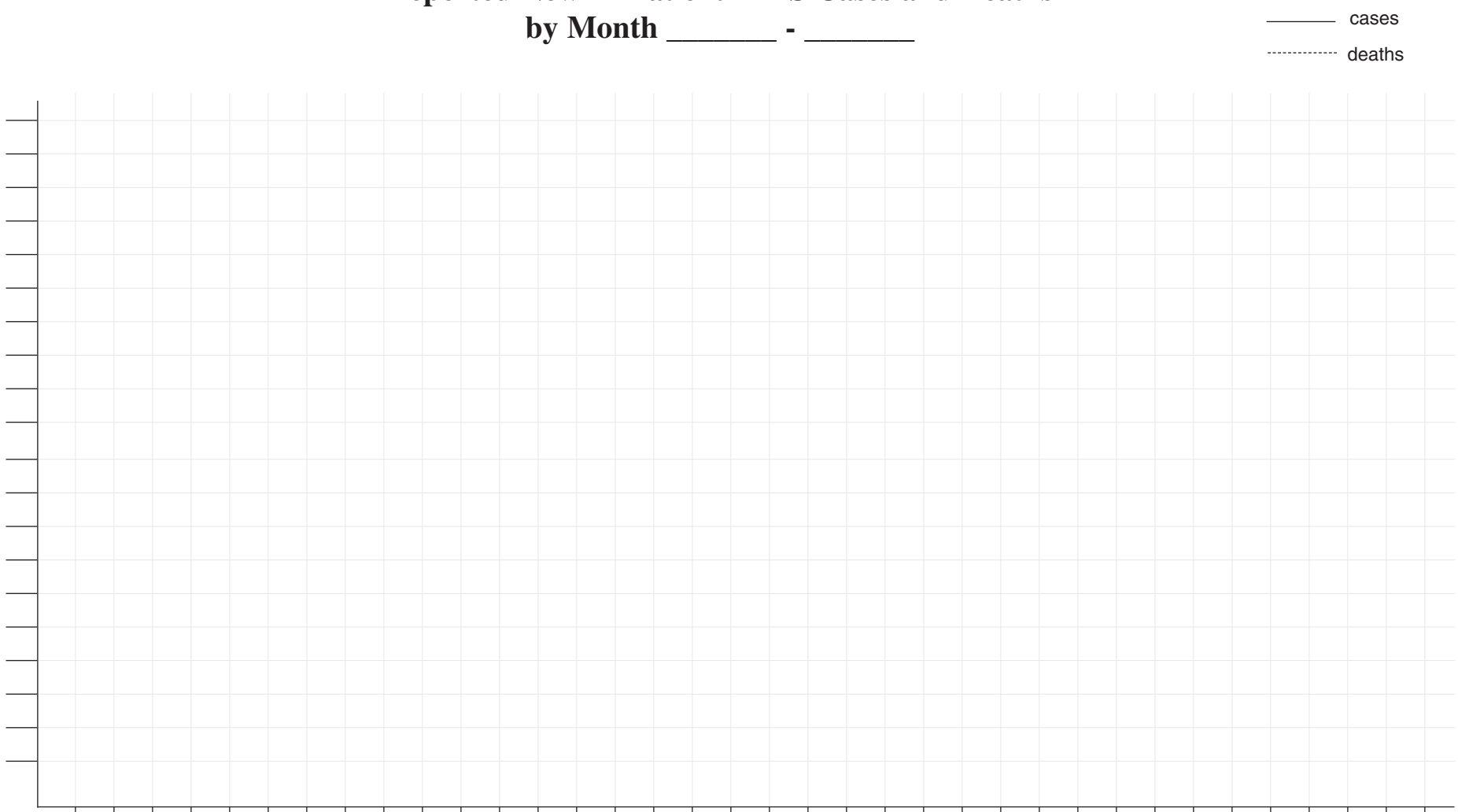
HIV AND AIDS

AIDS

Introduction

- Trends in AIDS cases will reflect trends in HIV infections from the previous 5 to 10 years since the interval from infection-to-AIDS ranges from 5 to 10 years. Trends in AIDS cases by age group and risk factors can be done at selected sentinel sites in the district.
- To understand the current HIV infection and HIV risk factor situation and trends in the district, other types of surveillance should be implemented, for example:
  - ▸ Unlinked anonymous HIV seroprevalence at sentinel sites (for example, antenatal clinics)
  - ▸ Trends in new smear-positive TB patients 15-24 years old
  - ▸ Trends in clinically-diagnosed and lab-diagnosed sexually transmitted infections

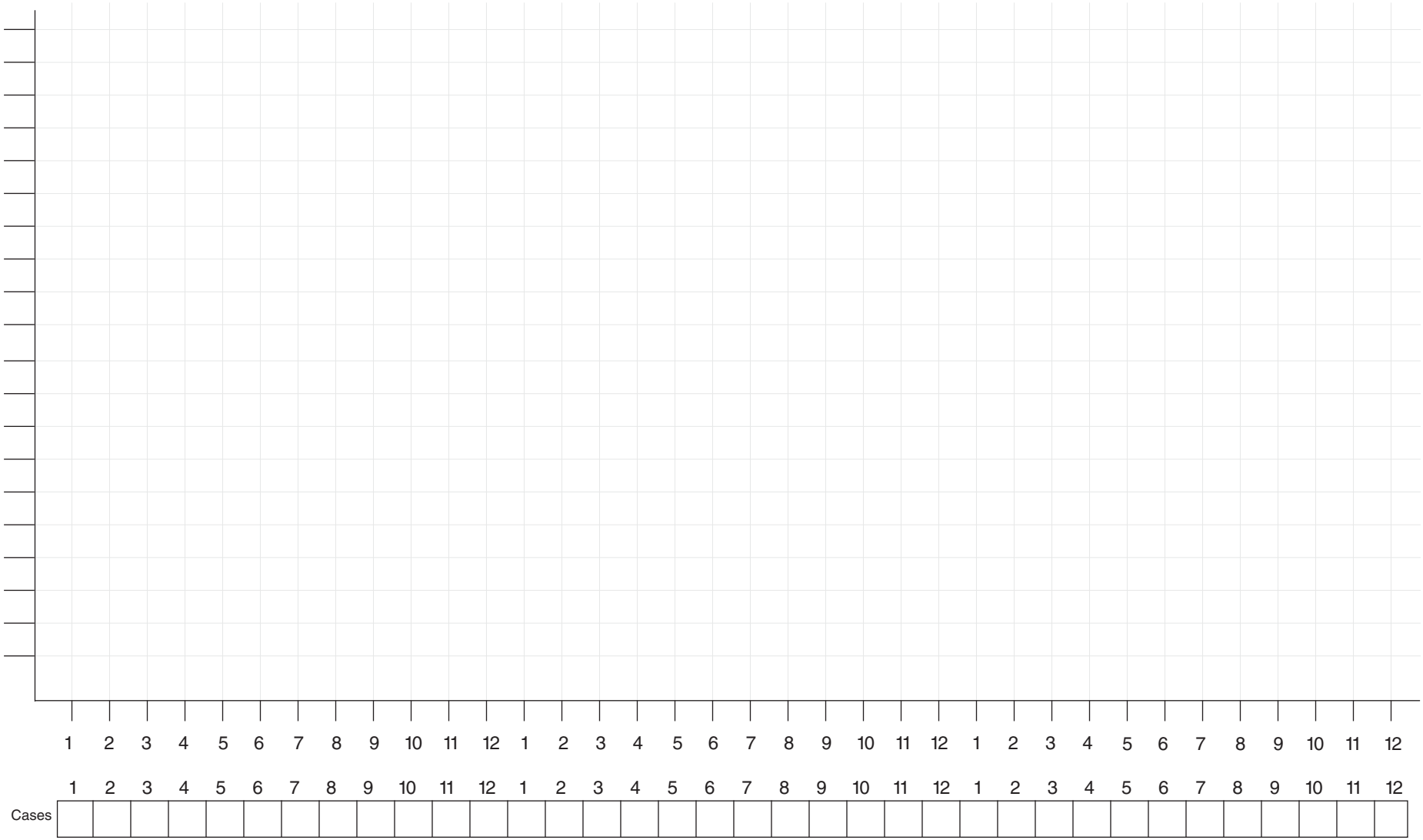
Reported New In-Patient AIDS Cases and Deaths by Month _____ - _____



	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Deaths																																				
Cases																																				
Case Fatality Ratio																																				

Reported New Out-Patient AIDS Cases
by Month _____ - _____

_____ cases



HIV SEROPREVALENCE IN ANTENATAL CLINICS

Introduction

- Districts with high rates of HIV will often have programs that test women attending antenatal clinics for HIV (Prevention of Maternal to Child Transmission [PMTCT]).
- If a high percentage of pregnant women who attend antenatal clinics accept HIV testing, the trend in HIV seroprevalence at antenatal clinics can be an important component of HIV surveillance for the district team.

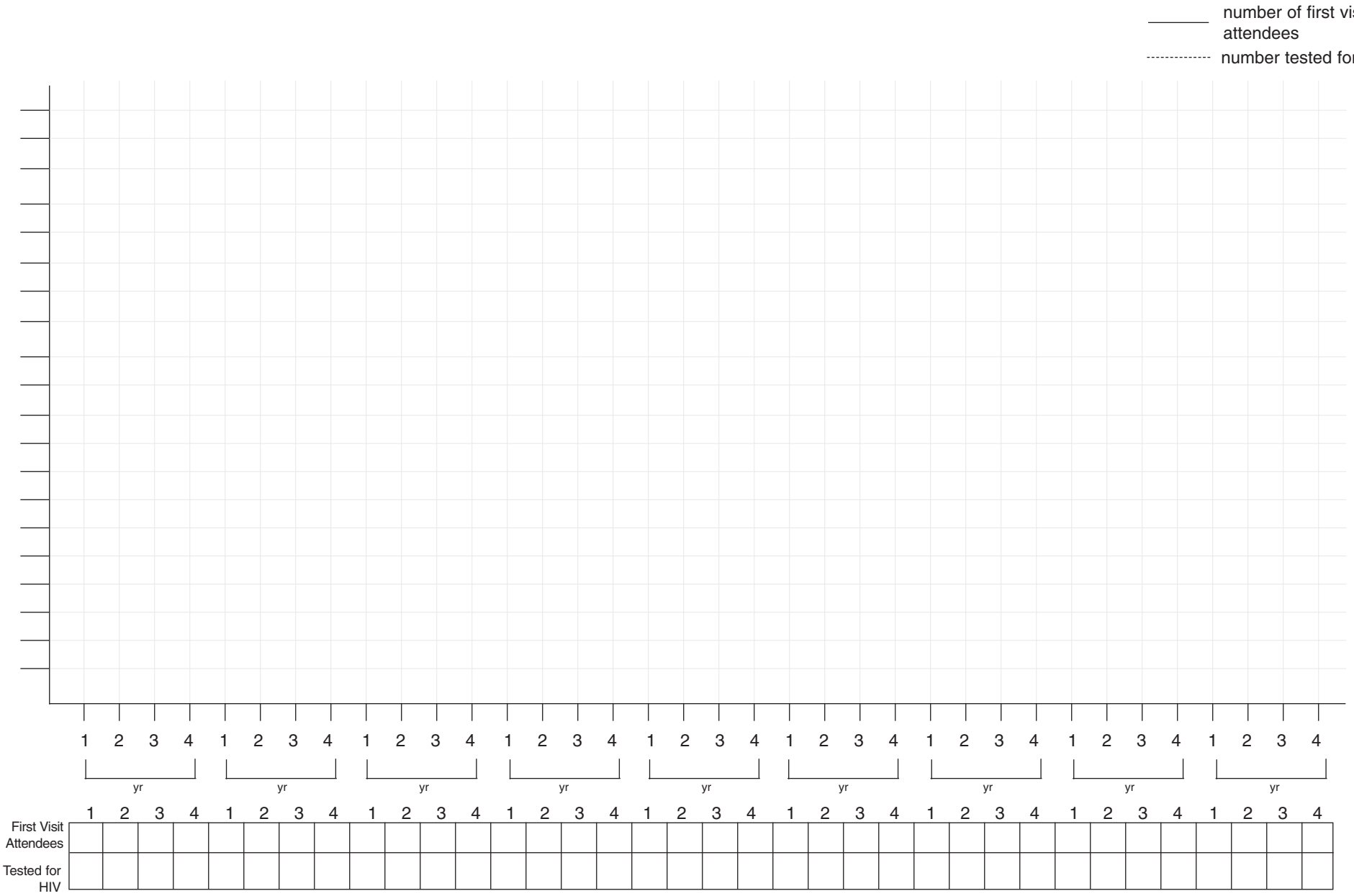
Analysis of time, place, and person.

- Trends in HIV prevalence in persons 15-19 years old and 20-24 years old are the most important to follow.
- Trends in prevalence in this age group are likely to follow closely trends in HIV incidence in this age group.
- HIV will affect pregnancy rates, but pregnancy rates for 15-19 year olds and 20-24 year olds will be affected much less.
- The percentage of pregnant women who attend antenatal clinics and the percentage of antenatal clinic attendees that accept HIV testing are important in interpreting HIV seroprevalence trends. The higher the percentages, the lower the potential for bias.

Public health action and targets.

- Youth HIV/STI prevention programs
- Excellent youth HIV prevention programs should be able to decrease HIV seroprevalence in person 15-24 years old by 50%

Number of First Visit Antenatal Attendees and Number Accepting HIV Testing for Prevention of Maternal-to-Child Transmission by Quarter, _____ - _____



HIV Seroprevalence from HIV Testing for Prevention of Maternal-to-Child Transmission by Quarter, _____ - _____

15-19 year olds	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
HIV+																																									
HIV tested																																									
% Positive																																								

20-24 year olds	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
HIV+																																									
HIV tested																																									
% Positive																																								

TUBERCULOSIS

TB

Introduction

- The district-level TB surveillance objective is to follow trends in pulmonary TB cases and indicators of complete treatment (which will render the patient non-infectious).
- There are two main forms of the disease tuberculosis, namely pulmonary TB and extra-pulmonary TB.
  - ▸ The pulmonary form of the disease, which spreads predominantly by droplet infection through coughing or sneezing, tends to be the infectious form. It is easily transmitted from person-to-person.
  - ▸ Extra-pulmonary TB that affects all other human organs apart from the lung tissue is rarely infectious.
  - ▸ From a public health perspective pulmonary TB is the primary focus for interventions. Among the pulmonary TB form, there are those with high bacillary load which are easily detected by light microscopic examination of sputum specimens (known as smear-positive PTB), and those with relatively low bacillary load which are not so easily detected by light microscopy (known as smear-negative PTB). Smear-positive pulmonary TB is more infectious than smear-negative pulmonary TB.
  - ▸ On average, a single smear-positive pulmonary TB case leads to 10-15 new infections in a year and 5-7 new clinically apparent pulmonary TB cases within a year.
  - ▸ HIV will cause the number of TB cases in a district to increase, even at relatively low levels of HIV infection in the district. In fact, the epidemiology of TB cases in a district may be a good indicator of the level of HIV, the geographic spread, and whether the HIV epidemic is concentrated in high risk populations or has spread widely in the general population.

Laboratory analysis

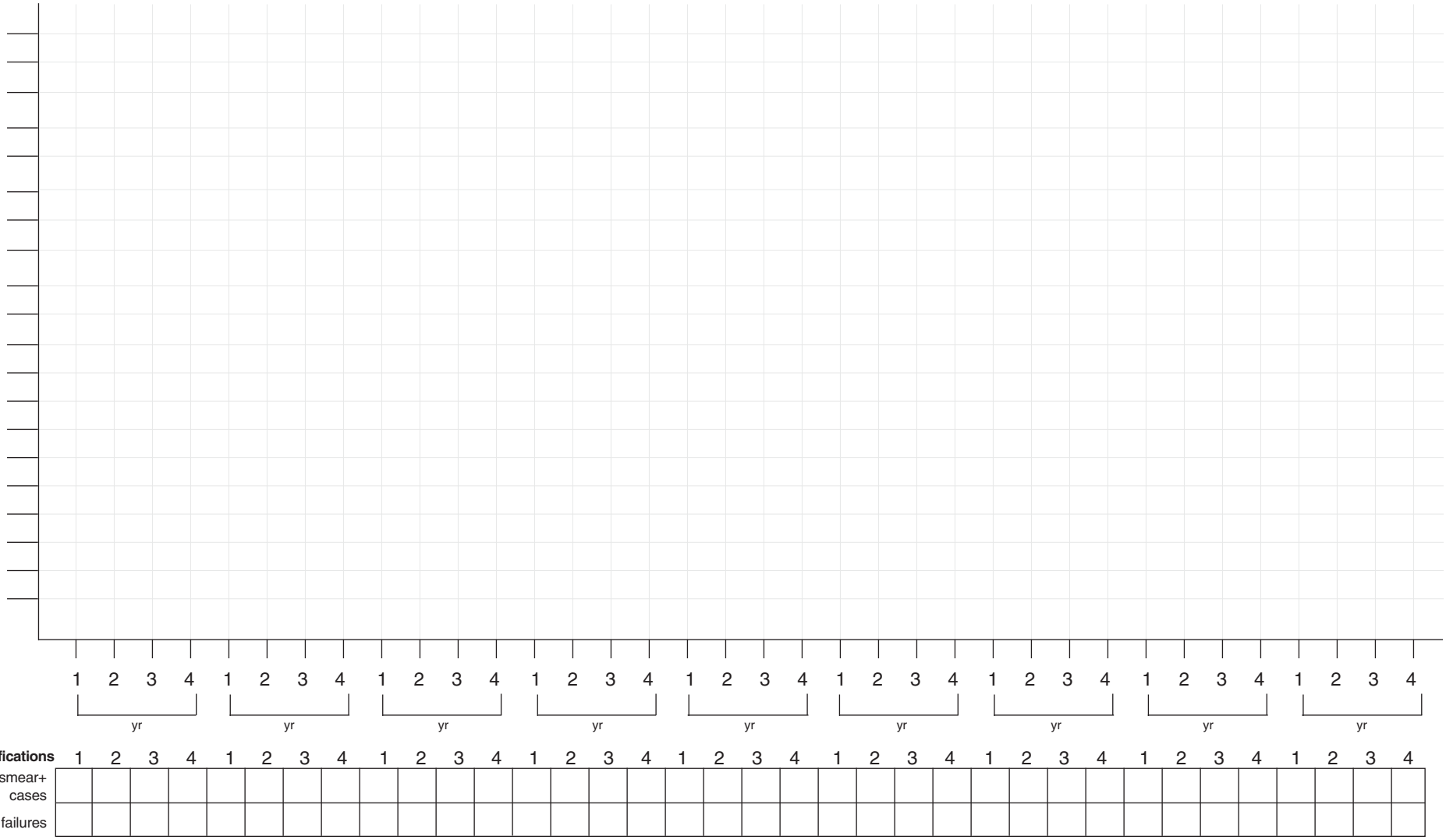
- Diagnosis of TB is based on bacteriological examination of sputum specimens for Acid Fast Bacilli (AFB) stained by the Ziehl-Neelsen method, using a light microscope. Three sputum specimens from a TB suspect, collected over two consecutive days must be examined.
- By definition, a new smear-positive pulmonary TB case is diagnosed when one of the following two scenarios emerge: 1) two positive smear results (out of the 3), 2) one positive smear result supported by suggestive radiological evidence, and a decision by a Medical Officer to treat with a complete course of anti-TB chemotherapy. The positive predictive value of a diagnosis of new smear-positive pulmonary TB using the two criteria above is approximately 80% for patients with highly infectious pulmonary TB. The sensitivity and specificity values for sputum smear microscopy are generally high (>70%).

Analysis of time, place, and person.

- New Case Notification Classifications.
  - ▸ Approximately 65% of all pulmonary cases registered in a quarter should be smear-positive.
  - ▸ If the percentage of smear-positive cases is significantly lower, the quality of diagnosis of pulmonary TB may be poor.
  - ▸ There should be approximately a 1 to 1 relationship between the number of new smear-positive cases and the number of new smear-negative cases and extra-pulmonary cases combined. Should this ratio be grossly distorted, then the quality of diagnosis may again be suspect. For example, extra-pulmonary or smear-negative pulmonary TB may be over-diagnosed.
  - ▸ If there is an increasing number of extra-pulmonary TB cases (in the absence of increasing over-all TB or smear-positive pulmonary cases), one should also consider an increase in HIV since HIV causes slightly more extra-pulmonary cases than pulmonary cases. With HIV both extra-pulmonary and

continued on the back of page 21

Reported Pulmonary Smear + Cases and Treatment Failures by Quarter, _____ - _____



Analysis of time, place, and person. (cont'd)

pulmonary will increase, but extra-pulmonary may increase slightly faster.

- ▸ If the ratio of smear-negative cases plus extra-pulmonary cases to smear-positive cases is too high, one should examine the quality of laboratory diagnosis.
- ▸ A decreasing trend of smear-positive PTB cases could indicate less reliance on smear microscopy for diagnosis leading to over-diagnosis of smear-negative and extra-pulmonary TB. For instance, there could be an over-diagnosis of smear-negative cases by the overuse of radiological examination by a clinician who is not familiar with the recommendations of the national TB programme guidelines.
- ▸ If there is an increasing number of smear-negative pulmonary cases (in the absence of increasing over-all TB or smear-positive pulmonary cases), the district team should consider: a problem with lab--false-negative smears, and over-use or over-reading of x-rays or other methods of diagnosing pulmonary TB.

• Category of Retreatment cases

- ▸ Under a well-performing program, the proportion of registered TB cases that result in relapse, failures, or retreatment after interruption should remain stable or decline with time.
- ▸ An increasing proportion of registered TB cases that result in retreatment usually indicates a decline in the performance of the TB program. An increasing proportion of registered TB cases that result in relapse can indicate increasing drug resistance.

• Age and gender of new smear-positive pulmonary cases.

- ▸ In the African Region, most cases occur in the 15-49 age group. Under the age of 15 years, the prevalence of disease is the same in both males and females. However, after 15 years, more males are affected than females. Thus, if the sex ratio before 15 years in a district is high in favor of males it may indicate poor accessibility of TB services for female children.
- ▸ Where TB control is effective, the age distribution of TB cases shifts to older age groups.
- ▸ Changes in age distribution of TB cases (increases in 15-24 year old females) may reflect the epidemiology of HIV in the district.

• Cohort Analysis of Treatment Results

- ▸ In calculating the cohort analysis of treatment results, the denominator is all registered patients. The percentage of registered patients that are evaluated and the percentage of all registered patients that are smear negative at the end of treatment (cured) are important indicators that the district should monitor.
- ▸ The percentage of registered patients that are cured should increase to 85%. It may be difficult to reach 85% "cured" in districts with high rates of HIV since many patients in each treatment cohort will die.
- ▸ An increasing proportion of patients registered but not evaluated, with failure or who interrupted treatment, is a warning sign indicating potential program problems.

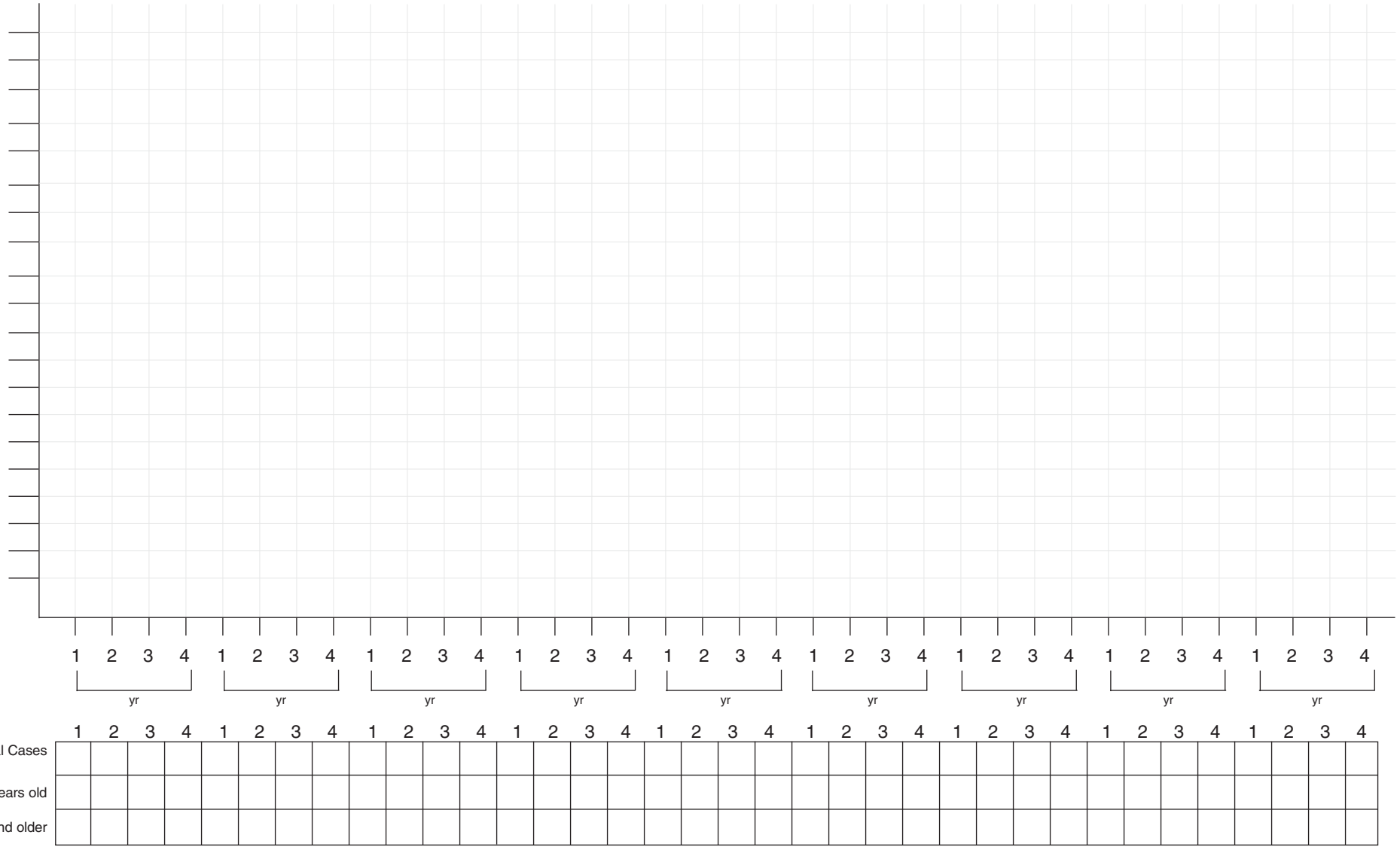
• Case fatality ratio

- ▸ In the absence of HIV infection, the case fatality ratio is approximately 0.15, but this is higher (0.20-0.30) in the presence of HIV infection. If case fatality increases, one should consider increasing HIV infection, increasing TB drug resistance, or poor program performance as the cause.

Public health action and targets.

- ▸ For control of TB in the African Region, WHO recommends the DOTS strategy (Directly Observed Therapy, Short-course). This is a cost-effective strategy based on early case detection primarily through microscopic diagnosis of sputum specimens and early treatment using a standardized combination of antimicrobials administered over a relatively short period (e.g. six months) under direct observation by a trained treatment supporter. When correctly applied, this ensures cure of infectious cases (and other cases) and thereby reduces the transmission of the disease.
- ▸ For individual patients, DOTS treatment results in a cure rate of >90% when correctly given.
- ▸ DOTS can result in a 10% decline in smear-positive PTB cases per annum in a district in the absence of HIV infection.
- ▸ The first priority of every TB program must therefore be to direct resources towards identifying the sick infectious cases (smear-positive pulmonary TB cases) so they can be cured. Correct implementation of DOTS in a district should result in cure rates of 80-85%.

Reported New Pulmonary Smear+ Cases by Age Group by Quarter, _____ - _____



TB Person Analysis

	Yr	Yr	Yr
	n (%)	n (%)	n (%)
Case Notifications			
Pulmonary - Smear+ New Case			
Pulmonary - Smear+ Relapse			
Pulmonary - Smear Negative			
Extra-pulmonary			
Total			
Category of Retreatment cases			
Relapses			
Failures			
Retreatment after interruption			
Total			

Age of new pulm. smear+ cases						
	M	F	M	F	M	F
0-14						
15-24						
25-34						
35-44						
45-54						
55-64						
65+						
Total						

Cohort analysis done on patients registered in the previous year

	Yr		Yr		Yr	
Smear Conversion	New pulm. smear+ (at 2 mo)	Re-rx smear+ (at 3 mo)	New pulm. smear+ (at 2 mo)	Re-rx smear+ (at 3 mo)	New pulm. smear+ (at 2 mo)	Re-rx smear+ (at 3 mo)
No. new sputum+ converted by 2-3 mo.						
No. new sputum+ evaluated with sputum by end of 3rd month (Denominator)						

Treatment Results	New pulm. smear+	Re-rx smear+	New pulm. smear+	Re-rx smear+	New pulm. smear+	Re-rx smear+
Total registered						
Total evaluated						
Smear neg. at end of treatment (cured)						
Complete treatment, but smear not done at end of treatment						
Died						
Failure						
Interrupted treatment						
Transferred out						

Cohort analysis on patients registered, semiannual

	1	2	1	2	1	2
Total registered						
Total evaluated						
Smear negative at end of treatment						
Complete treatment, smear not done at end						
	yr 1		yr 2		yr 3	

LEPROSY

LEPROSY

Introduction

• The 44th World Health Assembly adopted the resolution WHA44.9 to eliminate leprosy as a public health problem (prevalence rate <1 case per 10 000 total population) at the global and regional levels by 2000. At the third International Conference in Abidjan, a Global Alliance for the Elimination of Leprosy was launched and a new target (2005) was proposed with the recommendation to eliminate leprosy at the national level in all countries worldwide. Multi-drug therapy (MDT) is near 100% effective and case detection is relatively easy. Therefore, all should meet this target by 2005.

Guide for calculation of indicators

1. **Prevalence and prevalence rate.** Prevalence is the number of cases registered for MDT at a given point in time (on 31 December) and the prevalence rate is per 10 000 total population. The following types of patients are excluded from calculation of the prevalence rate: cured, defaulters, patients referred to other health centers, patients who are not on treatment for other reasons (died, transferred out).
2. **Detection and detection rate.** Number of cases newly detected in the period of the report and never treated before. The detection rate is per 100 000 total population.
3. **Definitions of Disability** Grade 0, 1, and 2.

   For hands and feet: Grade 0 - no anesthesia, no visible deformity or damage.
   Grade 1 - anesthesia but no visible deformity or damage.
   Grade 2 - visible deformity or damage present.

   For eyes: Grade 0 - no eye problems due to leprosy, no evidence of visual loss.
   Grade 1 - eye problem due to leprosy present, but vision not severely affected as a result.
   Grade 2 - severe visual impairment (vision worse than 6/60, inability to count fingers at 6 meters, lagopthalmos, iridocyclitis, and corneal opacities.)

   Method of calculation of percentage with Grade 2 disability: number of new patients diagnosed with disability grade 2 divided by the number of all new patients diagnosed during the period of the report.
4. **Cure rate.** Number of patients who have received a complete treatment (6 blisters for PB patients and 12 blisters for MB patients) in a group of patients detected during a given period (six months before the report period for PB patients and one year for the MB patients). To facilitate the calculation of the average cure rate, it is recommended to take the same period of one year before the report period, as well as for PB and MB patients, divided by the number of patients detected in the selected period.

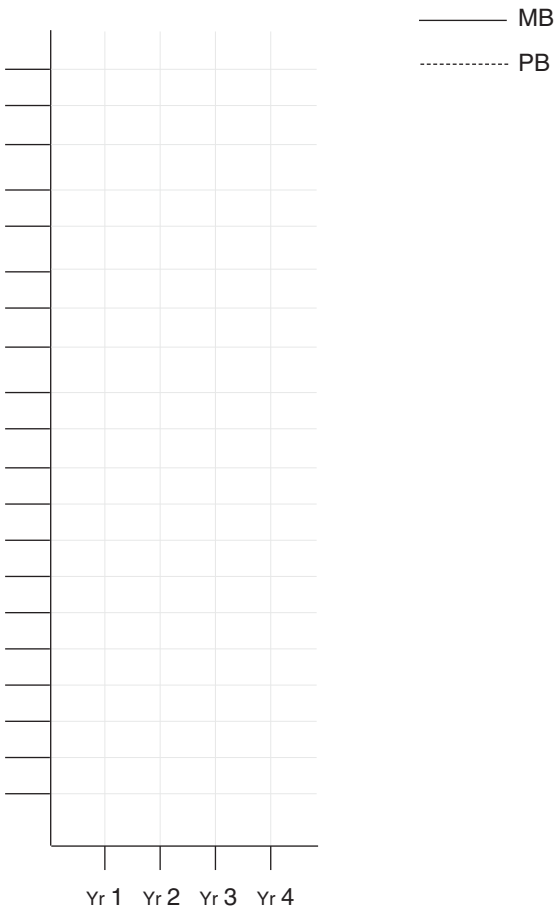
Analysis of time, place, and person.

• Prevalence rate. If the prevalence rate is high (prevalence rate >1 per 10 000 population), this can indicate several possibilities: 1) high transmission in the district, 2) result of leprosy elimination campaigns, 3) result of over diagnosis, 4) result of recycling of old patients, or 5) standard MDT regimen is not followed, or low cure rate (accumulation of patients).

• Detection rate. If the detection rate is high, the possibilities are the same as the first four above plus community awareness may be increasing. If the trend is decreasing, the following possibilities should be considered: 1) transmission is decreasing, 2) MDT services are becoming less active, or 3) image of leprosy has been damaged. Regarding 2) MDT services are becoming less active, it is natural to some extent that the detection decreases after intensified case finding activities like leprosy elimination campaigns. Review if the rest of the services are not deteriorating. Regarding 3) image of leprosy has been damaged, IEC activities could have a negative impact on the image of leprosy. Review IEC materials and interview patients and the community.

• Cure rate, defaulter rate. Cure rates should be as close to 100% as possible--it should be ensured that all patients registered for treatment are cured. Low cure rates, high defaulter rates and high proportion of patients still on treatment after having completed the standard regimen can indicate following problems: 1) MDT service not flexible. Improve service delivery to be more patient friendly, 2) Patient follow up is not satisfactory. Should improve follow up of irregular patients wherever possible, 3) patient is not well informed of importance of continuing MDT. Conduct proper patient education and counselling (see Guide for Health Professionals to Eliminate Leprosy as a Public Health Problem), and 4) MDT was not always available. Keep sufficient MDT stock and improve stock management.

Reported New Leprosy Cases by Year, _____ - _____



	1	2	3	4
MB Ad				
MB Ch				
PB Ad				
PB Ch				

Leprosy Analysis and Quality of Surveillance Program

	Yr		Yr		Yr		Yr	
	PB	MB	PB	MB	PB	MB	PB	MB
Elimination indicators								
Prevalence								
Prevalence rate								
Detection								
Detection rate								
Patient care indicators								
Proportion of children <15 yo among newly detected cases								
Proportion of cases with Grade 2 disabilities among newly detected cases								
Cure rate								
Managerial indicator								
Proportion of health facilities providing MDT services								