

Pattern and distribution of communicable diseases in border districts of Bukoba and Tanga, Tanzania

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Abstract: A study was undertaken in border districts of Bukoba and Tanga, Tanzania to determine the distribution and pattern of communicable diseases. The objective of this study was to develop health databases for the establishment of a disease surveillance system for 13 priority communicable diseases in Tanzania. Retrospective epidemiological data were collected from each health facility in the districts. Malaria, diarrhoea and pneumonia were the most important public health problems. Outbreaks of measles and meningitis were common in the two districts while cholera was prevalent in Tanga. Of recent, typhoid fever has become an important public health problem in the two districts. The risks associated with major epidemics and their control, are discussed in relation to integrated disease surveillance approach. Efficient and effective evidence-based disease surveillance is considered to be crucial for continuous disease monitoring and planning for their interventions.

Introduction

Communicable diseases are the major public health problems in Tanzania. They consume the scarce national health resources and affect negatively economic productivity thus exacerbating poverty. They also have potential for spread and are therefore a threat to the local and international community. Poor disease surveillance in Tanzania is one of the major factors responsible for the rising of mortality and morbidity due to communicable diseases (Mboera *et al.*, 2001).

Effective disease control requires prompt and adequate action towards reduction or elimination of existing conditions, and preventing the emergency of new ones and re-emergence of old diseases. Such actions can only be made if correct information reaches those required to take action timely. Disease surveillance is a watchful or vigilant monitoring system for health problems and their determinants with the intention of taking actions for improvement of health of a population.

Surveillance activities in Tanzania were developed in an uneven way and managed by different vertical disease control programmes. In 1998, the Ministry of Health in Tanzania has introduced integrated disease surveillance and response (IDSR) strategy. The IDSR strategy is designed to assist health workers to promptly detect and respond to diseases of epidemic potential, of public importance, and those targeted for eradication and elimination. This newly introduced approach aims to strengthen the disease monitoring systems at all levels.

Tanzania has identified 13 diseases to be included in the IDSR strategy and these are reported monthly (MoH, 2001). These diseases include bacillary

dysentery, cerebro-spinal meningitis, cholera, measles, plague, rabies, yellow fever, acute flaccid paralysis, neonatal tetanus, diarrhoea (in <5 years), pneumonia (in <5 years), malaria, and typhoid fever. The diseases have been selected basing on severity, importance as a burden to the community and the preferred frequency of reporting. The Ministry of Health also requires immediate reporting of all epidemics and encourages case-based reporting and line listing of cases during outbreaks and keeping zero reporting on weekly and monthly basis.

In many districts of Tanzania there is often a lack of reliable information on health care, and providers may find it difficult to deal with whatever data are available. Trends of disease outbreaks are also seldom tracked. This is because, at district and regional levels, there is lack of critical resources for surveillance activities and personnel lack training in epidemiology and disease surveillance. It was for this reason that in December 2001 health databases for the 13 communicable diseases were developed to provide baseline information on disease pattern and distribution in the two border districts of Tanga and Bukoba. Disease surveillance in the two districts is implemented with the support of the East African Integrated Disease Surveillance Network (Mboera *et al.*, 2001).

Materials and methods

Study site

Bukoba Rural District is located between latitude 1°25'S and longitude 33°51'E in north-western Tanzania, bordering Uganda. Climatically, the districts is characterised by high rainfall and humidity. The district has an estimated population of 461963, most

of whom are subsistence farmers. Coffee and banana are the major cash and food crops, respectively. The district is divided into 6 divisions and 15 wards and is served by 54 health facilities.

Tanga is one of the largest urban centres of Tanzania and lies on the coastal belt of the Indian Ocean between 5°7'S and 39°05'E, bordering Kenya. Most parts of the town lie at less than 40m above sea level. The rainfall pattern in the area is characterised by two peaks, the main one in April-June and another less pronounced peak in October-November. The district has an estimated population of 250000. Few people are either employed as civil servants, while the majority are engaged in small scale farming, fishing and petty businesses. The district is served by 52 health facilities.

Data collection

Retrospective epidemiological data (number of cases and deaths) were collected from each health facility in the 2 districts using Health Management Information System register books 2/27 (A-B) and Essential Drug Programme D2 forms covering a period between January 1984 and December 2001. At each health facility the books were collected and recorded in a form. The form was counter-signed by both the health facility in-charge and one of the investigators collecting the books. The books were carried in a sealed envelope to the district capital where data on the selected communicable diseases were entered in a computer.

The epidemiological data were entered into the Microsoft Excel matrix. Data for 1997-2001 were analysed and the following parameters were determined: (i) the major public health problems in each facility in the districts, (ii) monthly disease

patterns in the two border districts, and (iii) disease distribution in the 2 districts.

Results

Bukoba

Malaria, diarrhoea and pneumonia were the most important public health problems in Bukoba district. Bacillary dysentery, measles, typhoid fever and neonatal tetanus were reported with low frequencies. There were no cases of yellow fever, cholera, plague or acute flaccid paralysis reported in the district during the period under study. Neonatal tetanus and dog bites/rabies were reported only at Bubale dispensary.

Gradual increases in the number of cases of bacillary dysentery were observed since 1998. The disease was common in north-western and eastern parts of the district. Cases of bacillary dysentery were persistently high in Kyamutwara and Misenyi Divisions. The disease showed a seasonal pattern with most cases occurring during May and September (Figure 1). On the other hand, typhoid fever was reported in four health facilities, most frequently in Bubale where cerebrospinal meningitis was also common.

Large numbers of diarrhoea cases were recorded in 1999. However, on average over 200 cases of diarrhoea were reported in Bukoba each year during the past 5 years. Although diarrhoea cases were reported uniformly throughout the year, large numbers of cases in 2001 occurred during the long rains of February-May.

In Bukoba, epidemic-prone diseases were reported in all divisions except in Kiziba. Misenyi Division was the most hit area, with outbreaks of bacillary dysentery, measles, typhoid fever, neonatal tetanus and cerebro-spinal meningitis.

Table 1: Occurrence of epidemic diseases in Bukoba District 1997-2001

| Division | Affected areas | Disease outbreak |
|------------|--|---|
| Bujugo | Buhengabo, Nyakato, Kaagya, Kishanje Rubafu | Bacillary dysentery Measles |
| Kyamutwara | Katoma, Karabagaine, Maruku, Kanyangereko | Bacillary dysentery Measles, Typhoid fever |
| Katerelo | Bujugo, Katerelo, Ibwera, Mikoni, Kasharu, Katoro, Kyamulaile | Bacillary dysentery Measles |
| Rubale | Butelankuzi, Rubale, Izimbya, Kibinzi Ruhunga | Measles, Meningitis |
| Misenyi | Kilimilire, Kyaka, Kasambya, Nsunga, Minziro, Bugorora | Bacillary dysentery, Measles, Meningitis, Neonatal tetanus, Typhoid fever |
| Kiziba | NIL | NIL |

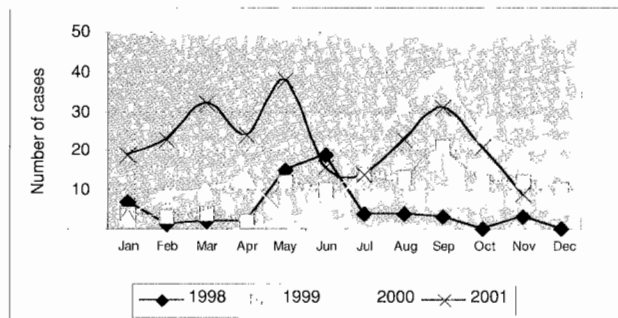


Figure 1: The pattern of bacillary dysentery in Bukoba

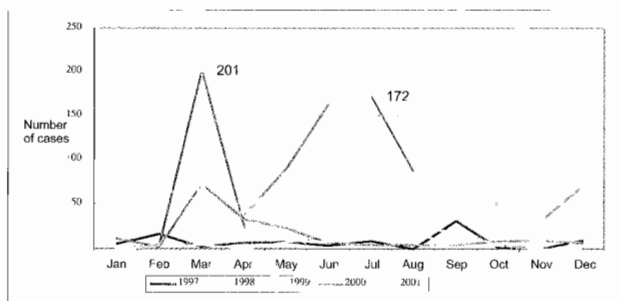


Figure 2. The pattern of measles in Bukoba

Measles was the commonest epidemic prone disease in the district (Table 1) being reported in 46% of the facilities surveyed and with high incidences in Mwamaga, Kyaka, Rubale, Kilimilire, Minziro, Kyamulaile and Nsheshe areas. A total of 313 cases of measles were reported from the district in 2001 alone. Most of the cases of measles were occurring during March and June/July (Figure 2).

Tanga

Malaria, diarrhoea and respiratory tract infections were the major health problems in Tanga District. Other important diseases included measles, typhoid fever, cholera and bacillary dysentery. There was no definite seasonal pattern in the occurrence of malaria in the district. The number of cases of malaria had been increasing markedly from <5,000 in 1997 to >20,000 in 2001. Diarrhoea was common in Ngamiani, Chongoleani, Kisosora, Mabokweni, Mafuriko, Pongwe, Kirare, Mwakidila, Pande, Tongoni and Makorora areas. The occurrence of diarrhoea was seasonal with most of the cases occurring in April-May. The number of cases of diarrhoea has gradually increased from 1997 to 2001.

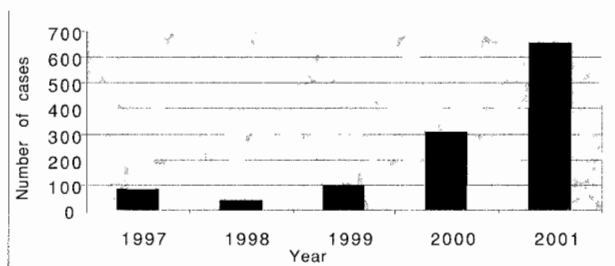


Figure 3. Annual cases of typhoid fever in Tanga

Cases of typhoid fever have increased by 8-fold from 1997 to 2001 (Figure 3). Most of these cases were however, reported from private health facilities including Safi Medics and Fazal Memorial Hospitals, Al-Molhem Health Centre, Burhani and Pande JWTZ Dispensaries.

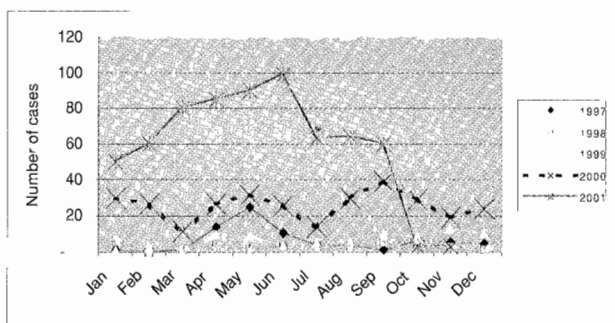


Figure 4: The pattern of measles in Tanga District

Bacillary dysentery was reported every year since 1998 with total numbers of cases rising from 115 in 1998 to 689 in 2001. The disease was most common in March-September. Most of these cases were reported from a military dispensary at JWTZ Pande. Measles was most prevalent in Chongoleani, Kisosora, Mwakidila, Ngamiani, Pongwe, Tongoni, Mabokweni, Mafuriko and Makorora. Most cases of measles in 2001 occurred during the months of June-September (Figure 4).

Discussion

Malaria, diarrhoea and pneumonia are the most important health problems in the 2 border districts. This is true for most of the districts in Tanzania (Magesa *et al.*, 2001). Data collected from the two districts continue to show that malaria is the leading cause of morbidity.

Bacillary dysentery, though at low frequency was reported from 5 of the 6 divisions of Bukoba district. The disease is common during the period when most of the rains are received in the district. In both Bukoba and Tanga districts an increase in cases of bacillary dysentery are likely to be due to lack of safe water and poor hygiene. In recent years, bacillary dysentery has also been reported from other districts of Tanzania. For example, in 1998-1999 the disease was reported as an important cause of morbidity and mortality in Igunga, Lindi, Lushoto, Handeni, Makete and Mtwara. Of these districts, Bukoba and Igunga were the most affected districts (Magesa *et al.*, 2001).

In the two districts, typhoid fever has become an important public health problem in recent years. In Tanga, most cases of typhoid fever were reported from private-owned health facilities. Typhoid fever is also an important disease in Handeni, Manyoni, Morogoro rural, Igunga and Mbozi districts (Magesa *et al.*, 2001). The high frequency of reporting of the disease in the country is most probably due to poor diagnostic facilities and lack of qualified laboratory personnel in our health facilities.

Typhoid fever is often over-diagnosed in Tanzania. Many patients, who come to health facilities with positive *Widal test*, results are treated for typhoid fever. For example, many cases of poorly treated or resistant malaria are overlooked because of the over diagnosis of typhoid fever. Experience has shown that our laboratory personnel, especially in private for profit facilities, have failed to adopt the standard tube dilution test procedure. This procedure eliminates most of the artefacts that are likely to give a positive *Widal test*, compared to the semi-quantitative method using the slide-test. The semi-quantitative test to determine the titre is also subjective as results are not comparable and reproducible between medical laboratory practitioners. Moreover, the problem of autoagglutination associated with the *Widal test* kit is often overlooked, especially by unqualified laboratory personnel. It is important that in our poorly equipped health facilities, the diagnosis of typhoid be made mainly on a clinical basis alongside the standard tube test and other associated tests including, stool microscopy and culture. The traditional *Widal test* may be useful where a baseline titre level for the community has been established (Usman, 2002).

Most outbreaks of measles and meningitis that were reported in Bukoba District were localised in Misenyi Division. Measles outbreaks were also commonly reported in Tanga. There are already unpublished reports of measles observed in older individuals who are likely to have not been immunised during their childhood. Current surveillance data from other African countries show that on average, 50% of measles cases occur among children aged 5-14 years.

Furthermore, significant measles mortality was experienced in this age group than was previously realised. This measles picture is observed in countries like Kenya and Tanzania where routine vaccination coverage is 70-80%, as well as in Burkina Faso, Cameroon and Mali where vaccination coverage rates are only 50-60% (Anon, 2002).

Measles is the leading cause of childhood death among the vaccine preventable diseases in Africa killing 450,000 children annually (WHO, 2001). WHO recommends that all children get a second opportunity to receive measles vaccination to reduce the number of susceptible children in the community and thus, prevent outbreaks. In Tanzania measles incidence rate decreased from 200 to 44 per 100,000 from 1990 to 1995 with a case fatality rate of 5% and inter-epidemic period of 4 years. Tanzania has been implementing measles control activities in the country since 1999 and thus giving her children a second opportunity for measles immunization. However, even after implementing supplemental immunization in two thirds of the country surveillance shows that outbreaks still occur with a shift of cases from the <5-year to >5-year age group. Analysis of year 2000 measles outbreak showed that 2% of cases occurred in <9 months old, 20% occurred in ages from 9 months to 5 years, whilst 60% occurred in 5-15 years and 10% occurred in children above 15 years (WHO 2001). Thus to be able to interrupt transmission the Ministry of Health has decided to widen the age group targeted for measles immunisation to include all children susceptible found during the outbreaks.

Although Tanzania is outside the meningococcal belt, sporadic cases have been reported in many districts. In 1999 meningitis was reported in 60% of the districts of Tanzania (Magesa *et al.*, 2001) with serious epidemics occurring in Arumeru, Igunga, Kyela, Mbulu, Meatu, Muheza, Ruangwa and Tunduru districts. Recently, an outbreak of meningitis occurred in Kibondo District in July-August 2002. The most affected areas included the Nduta, Karago, Mtendeli, Mkugwa and Kanembwa refugee camps. The civilian population of Kibondo, Kigoma and Kasulu districts was also affected. As high as 26.8% case fatality rate was reported in the affected areas (EAIDSNet 2003). It is suspected that the recent meningitis epidemic in Tanzania spread from neighbouring Rwanda and Burundi. Meningitis was reported in Burundi about June 2002 and in Rwanda in mid-July 2002.

Rabies is spreading in many parts of Tanzania. Before 1971, the disease was confined to Iringa, Kigoma, Dodoma and Kagera Regions. By 1977, however, the disease had spread to most parts of the country. Although of recent, only one case of dog bite was documented in Bukoba district, rabies appears to re-emerge fast with high incidences in 28.9% of the

districts of Tanzania and with high mortality rates in Manyoni and Newala (Magesa *et al.*, 2001). Recent reports from Arusha have shown that cases of dog bites have increased by 44.3% from 2000 to 2001 (EAIDNet, 2002) with rabies causing deaths of 5 people.

There are various reasons as to why communicable diseases remain the major public health problems in the two districts and Tanzania in general. The level of personal hygiene and environmental sanitation is poor. Records show that most of the leading health problems are related to hygiene and sanitation. Although some investments have been made in water supply and sanitation programmes by government and non-governmental organisations, water, sanitation and hygiene related diseases remain high with outbreaks of cholera threatening endemicity (EAIDNet, 2003). This has probably been due to inadequate community participation in the programme cycle, thus hindering sustainability of these programmes.

Other reasons which may lead to the increased number of disease incidences and deaths include reduced immunisation coverage, competing priority for resources, increased transmission risks due to migration from rural to urban areas, poverty, overcrowding, inadequate health services (Mboera *et al.*, 2002) as well as poor surveillance systems (Mboera *et al.*, 2001). All these need to be addressed if we are to keep our population healthy. There is also a need to put in place strategies that will detect and promptly respond to diseases of epidemic potential. Epidemic early warning systems will help districts to respond as quick as possible to outbreaks, set priorities, plan interventions, mobilise and allocate resources.

Tanga and Bukoba districts are among few districts under the East African Integrated Disease Surveillance Network (Mboera *et al.*, 2001). The Network, established in February 2000, aims at bridging the gap in communication on surveillance of communicable diseases among the three Partner States. The Network was established in recognition of the need for a concerted effort to ensure that correct information is obtained and shared in order to hinder the spread of infectious diseases. The health database developed in the two Tanzanian districts fulfils the endeavour of the Network and provides baseline information on the pattern and distribution of communicable diseases in the two border districts. The goal of Network is to promptly prevent and control outbreaks and spread of diseases within the region.

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