[Case Report]

The Role of Veterinary Public Health in Poverty Alleviation in Uganda

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Summary

Livestock continue to play a significant role as a source of wealth, protein nutrition and income to the poor households in Uganda. Although the benefits are obvious, a number of health problems are associated with livestock and livestock products that may affect the poor both as producers and consumers. The poor are vulnerable and are exposed, in many cases unknowingly, to diseases of economic and public health importance such as trypanosomosis, tuberculosis, rabies among others. A major pitfall is that Veterinary Public Health (VPH) activities have not been fully integrated in the main stream of public health services in Uganda and many other countries in the world. This paper provides an insight in the rightful role that veterinary public health must be seen to play in the overall public health framework with respect to the poor in Uganda.

Key words: Poverty Alleviation, Uganda, Veterinary Public Health

Profile of Uganda

Uganda is a landlocked country located astride the equator in eastern Africa bordering the Republic of Kenya to the east, the Republic of Sudan to the north, the Democratic Republic of Congo to the west and the Republic of Tanzania to the south (Figure 1). The country occupies an area of 236,040 km² of which 15.4% is fresh water. The population is estimated at 21 million with a population growth rate of 2.9% (World Bank, 2000). The country is favoured by a good climate and fertile soils and the agricultural sector has the potential to feed the country, to supply food for the regional market, to export horticultural products in addition to the traditional crops, to produce industrial raw materials, and generally to act as a powerful engine of growth.

Current estimates show that eighty-five percent of Ugandans, and 96% of the poor live in rural areas, and the rural population is growing at a rate of nearly 3% per year (MFPED, 2001). Approximately two-thirds of the 3.5 million rural households in Uganda are engaged in unproductive, low-input/low-output farming. In Uganda, agriculture is mainly rain-fed and households produce food largely for their own consumption. Among these farmers the average land holding is less than two hectares of land. Consequently, low productivity gives farmers little flexibility to seek alternatives or to diversify their investment options. From an environmental perspective, poverty contributes to and drives the erosion of biodiversity and compels many to forego longer-term investments in sustainable land use in favor of short-term resource exploitation to stave off food insecurity (Uganda, 2002).

The poor, who form the bulk of the rural and urban popula-

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1 A national census was carried out in Sept 2002 and preliminary results indicate a total population of 24.6 million people.
2 Those who live below the poverty line i.e. earn less than a dollar a day.
tion in Uganda, live mainly in the countryside and in urban slums, respectively. They are characterized by lack or have minimal access to land, capital, employment, education, health services, safe water, information and affordable energy sources; have little, if any, opportunity to influence decisions that affect their lives; sometimes live in conditions of insecurity; often have large families and are likely to engage in practices that are likely to damage their health and the environment such as farming in marginal areas and use of poor agricultural practices (Uganda, 2002).

Economically, the country is dominated by the Agriculture sector, which accounts for 43% of the Gross Domestic Product (GDP), 85% of the export earnings, 80% of the employment. The livestock sub-sector contributes 17% of the agricultural GDP. This sector is dominated by cattle (numbering about 5.6 million) in importance and value, produces an estimated 662 million litres of milk and 93,259 metric tons of meat annually. Consequently, the annual per capita availability of meat and milk is extremely very low, estimated at only 4 to 6 kg of meat and 24 to 30 litres of milk, respectively, compared to the FAO/WHO recommended 50 kg of meat and 200 litres of milk per annum (MAAIF, 2001). This is largely a result of poor purchasing power of the majority of the population as well as inadequate supply of these products.

**Burden of disease and Poverty in Uganda**

Communicable/infectious diseases still predominate as the burden of disease in developing countries although the 1990 global estimates of non-communicable diseases such as ischemic heart disease and psychiatric disorders were expected to account for the highest proportion in developing countries (Murray and Lopez, 1990; Murray et al., 2001; Gwatkin and Gulliot, 2000). HIV/AIDS, lower respiratory infections, malaria and diarrheal diseases top the list account-

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Under 5 years old</th>
<th>Above 5 years old</th>
<th>All age groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>25.4</td>
<td>25.8</td>
<td>19.2</td>
</tr>
<tr>
<td>Acute respiratory infections</td>
<td>26.5</td>
<td>23.4</td>
<td>18.2</td>
</tr>
<tr>
<td>Intestinal infections</td>
<td>9.1</td>
<td>23.4</td>
<td>7.8</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>8.8</td>
<td>5.8</td>
<td>5.2</td>
</tr>
<tr>
<td>Trauma</td>
<td>5.5</td>
<td>7.7</td>
<td>5.5</td>
</tr>
<tr>
<td>Skin disease</td>
<td>5.0</td>
<td>3.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Eye disease</td>
<td>4.7</td>
<td>3.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Dental problems</td>
<td>3.6</td>
<td>2.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Genital disease</td>
<td>2.8</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Anaemia</td>
<td>1.5</td>
<td>4.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>2.3</td>
<td>3.1</td>
<td>2.8</td>
</tr>
<tr>
<td>Maternal complications</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
</tr>
</tbody>
</table>

(—) indicates that data not available, Source: Ministry of Health, 1997.
The Role of Veterinary Public Health in Poverty Alleviation in Uganda

for 22.6%, 10.1%, 9.1% and 6.7% of the total deaths on the African continent, respectively (Murray et al., 2001). These figures are similar to those reported by the Uganda Ministry of Health shown in Table 1 (Ehrhart and Tumusiime, 2000). Ugandans do recognize ill health to be a major cause and consequence of their poverty like elsewhere (Ehrhart and Tumusiime, 2000). Ill health may demand that scarce resources be spent on transport to health clinics that are usually quite far, user fees and medicine, among others. The poor without ready cash may resort to selling their assets including land and livestock to meet health care costs especially when afflicted by a debilitating disease like HIV/AIDS. Uganda is one of the countries in the world that has been most hit by HIV/AIDS. Since 1982 when the first case of AIDS was diagnosed in Uganda, approximately 850,000 people have died from the disease and over 1.5 million Ugandans are estimated to be living with the virus that causes AIDS (Ministry of Health, 2001). With respect to poverty, HIV/AIDS could be both a cause and a consequence (Figure 2). For example, poor people are likely to be ignorant of safety measures against contracting HIV, may lack access to preventive interventions and due to vulnerability and desperation could easily be driven into acts of high risk behavior such as commercial sex workers. As a contributor to increased poverty, HIV/AIDS among the poor leads to increased dependency with increased costs of health care, little or no productivity and hence reduced income, and lack of access or affordability of health care services once infected (Figure 2).

Because of the negative effect of HIV/AIDS on the economy, the Uganda government placed a high priority on this problem early enough and this has resulted in a steady decline in the rates of infection from a high of 30% in some areas of the country in 1992 to a weighted antenatal rate of 6.1 by the year 2000 (USAID, 2002). HIV/AIDS has been and continues to be influential on the health status of nations. The health indicators in Uganda are still some of the lowest in the world. The life expectancy at birth of 42 years is rather similar to Kenya and South Africa’s 47 and 45.4 years but above Senegal and Zimbabwe’s 26 and 36.5 years, respectively. However, the infant mortality rate of 97 per 1000 live births in Uganda is one of the highest in the world (US Census Bureau, 2002; Ehrhart and Tumusiime, 2000).

**Indicators for poverty assessment related to Public Health in Uganda**

Poverty has many faces and, therefore, has been variously defined. According to the World Bank, poverty is a state of powerlessness, lack of representation and freedom (World Bank, 2002). However, the measurement of poverty continues to pose a challenge to social scientists worldwide (MFPED, 2001). Various indicators to estimate poverty levels have been used by different institutions. Recent indicators related to public health used to assess poverty in Uganda are given in Table 2 for the years 1995/6 and 2001. Estimates indicate that approximately 35% (about 7.8 million people) of the Ugandan population (of approx. 22.3 million people) live below the poverty line i.e. earn less than USD 1.00/day (Thoraya, 2002).

Appleton (2001) used the absolute poverty line method based on consumption expenditure as a proxy for income in his economic analysis of poverty in Uganda over the years 1992-2000. Absolute poverty line was defined as the monetary cost of obtaining both the 3,000 calories food requirement based on a typical diet of a poor person and non-food requirements (i.e. clothing, health and education for a poor person) for a person of 18-30 years engaged in moderate work. Based on the 1992/93 Integrated Households Survey (HIS), the 1997/98 Fourth Monitoring Survey (MS-4) and the 1999/2000 Uganda National Survey, a comparison was made to show evolution of poverty in Uganda (USAID, 2002). These surveys showed that the important determi-
nants of household real consumption expenditure growth and hence poverty reduction were asset ownership, access to electricity, good household health status, cash crop production, presence of peace and security. The results showing the evolution of poverty are given in Table 3 and trends shown in Figures 3 & 4. Based on consumption data collected over the years 1992-2000, the overall incidence of poverty in Uganda was estimated to be 56%, 44% and 35% in 1992, 1997/8 and 1999/2000, respectively indicating a decreasing trend in poverty levels over the years. Clearly, poverty fell more significantly in urban than in rural areas (Figure 3).

Region-wise, although the overall trend in the level of poverty fell in the three regions of East, West and Central over the study period, this trend was absent in the northern region of Uganda. Indeed, the level of poverty actually increased from 60% in 1997 to 67% by the year 2000 in the northern part of the country (Figure 4) (Appleton, 2001). The increasing levels of poverty in northern Uganda were attributed to a high prevalence of insecurity due to rebel activities and continued insurgency, frequent cattle rustling and lack of alternative viable economic activity to livestock particularly in the Karamoja area, thereby creating a vicious cycle of poverty in the region (MFPED, 2001). Support for the overall decreasing trends in poverty nationally is given by the Human Development Index (HDI) that ranks countries based on achievements on longevity (life expectancy), knowledge (school enrolment and adult literacy rate) and decent

### Table 2 Health Indicators and their values in 1995/96 and 2001

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>1995/96</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stunting Prevalence (%) (children &lt; 4 years)</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td>Infant mortality rate (per 1000 live births)</td>
<td>97</td>
<td>88</td>
</tr>
<tr>
<td>Under five mortality rate (per 1000 live births)</td>
<td>147</td>
<td>152</td>
</tr>
<tr>
<td>Immunization coverage in % (for 12-23 mo olds)</td>
<td>47</td>
<td>37</td>
</tr>
<tr>
<td>Total fertility rate (average no. of children woman)</td>
<td>6.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Maternal mortality rate (iper 100,000 live births)</td>
<td>550</td>
<td>506</td>
</tr>
<tr>
<td>Contraceptive prevalence (%) (women aged 15-49 years)</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>Life expectancy at birth</td>
<td>42</td>
<td>43.4 (est)</td>
</tr>
<tr>
<td>Number of HIV + people (millions)</td>
<td>1.9</td>
<td>0.82 (est)</td>
</tr>
<tr>
<td>Population per doctor</td>
<td>18,700</td>
<td>NA</td>
</tr>
<tr>
<td>Access to safe water (% of population with access)</td>
<td>34</td>
<td>NA</td>
</tr>
<tr>
<td>Access to sanitation (% of population with access)</td>
<td>57</td>
<td>NA</td>
</tr>
</tbody>
</table>


### Table 3 Mean Annual Decline in Poverty Levels in Uganda

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Nationally</td>
<td>4.4</td>
<td>9.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Urban/Rural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>9.7</td>
<td>18.2</td>
<td>12.6</td>
</tr>
<tr>
<td>Rural</td>
<td>4.0</td>
<td>8.5</td>
<td>5.5</td>
</tr>
<tr>
<td>Regionally</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central</td>
<td>9.4</td>
<td>12.3</td>
<td>10.3</td>
</tr>
<tr>
<td>Western</td>
<td>4.2</td>
<td>15.6</td>
<td>8.2</td>
</tr>
<tr>
<td>Eastern</td>
<td>1.6</td>
<td>13.9</td>
<td>5.9</td>
</tr>
<tr>
<td>Northern</td>
<td>3.7</td>
<td>-3.3</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Source: Appleton, 2001

Fig 3 Incidence of Poverty in Uganda between 1992 - 2000 (Appleton, 2001)
standard of living (measured by GDP per capita). This has shown an improvement in the HDI for Uganda from a ranking of 158 to 150 in 1997-98 and 2001, respectively (UNDP, 1998-2002). This achievement could be partly attributed to the health sector policies being pursued by the Ugandan government.

The government of Uganda through the Health Sector Strategic Plan (HSSP) and within the framework of the Poverty Eradication Action Plan (PEAP) has set targets by introducing the Minimum Health Care Package whose principle is to provide Primary Health Care (PHC) in the country (Ehrhart and Tumusiime, 2000). The components of the MHC package are six fold, namely:

1. Prevention and control of communicable diseases e.g. malaria, HIV/AIDS, Sexually Transmissible Infections (STI), Tuberculosis
2. Use integrated management approaches to childhood illnesses at health facilities
3. Support sexual and reproductive health rights e.g. antenatal care and delivery, family planning and working to end violence against women
4. Other public health interventions e.g. immunization, health education, epidemic and disaster prevention, disease eradication
5. Mental health care and rehabilitation
6. Essential clinical care and rehabilitation

Although the principle of PHC is important in ensuring community health, VPH an essential component of public health and exists in the set-up of the Uganda Ministry of Health has not been integrated within the Primary Health Care delivery system. This is in contrast to developed countries where veterinarians through the practice of VPH are now rightfully playing a significant role in public health activities (Waltner-Toews, 2001).

Aspects related to animals that affect the health/well-being of the poor

The health of human beings is in many ways related to animal health, both domestic and wild. VPH is the link between animal health and foods of animal origin, and human health. This is reflected in the holistic definition of VPH as 'the contribution to the complete physical, mental and social well-being of humans through an understanding and application of veterinary science' (WHO, 1999). Unfortunately, the practice of VPH has erroneously been perceived by the public and other sister professions to be confined in the abattoir/slaughter houses only. Among the various functions of VPH is the control of the transmission of zoonotic diseases and their agents either directly or through foods (there are over 200 known zoonotic diseases and the number is rising). Zoonoses have been defined as diseases and infections that are naturally transmitted or shared between vertebrates and humans (Acha and Szyfres, 1987).

Livestock continue to play a significant role as a source of wealth, protein nutrition and income to the poor households in Uganda. Although the benefits are obvious, a number of health problems are associated with livestock and livestock products and may affect the poor both as producers and consumers. As producers, the poor are exposed to a number of factors that exacerbate their poverty. Diseases of economic and public health importance such as trypanosomosis, a major constraint to livestock production causes debility, mortality and low productivity in animals. The tsetse flies are vectors of human sleeping sickness that is more prevalent among the human populations in the south-eastern districts of Uganda (MAAIF, 2001).

There is little information available on the magnitude of zoonotic diseases in humans in Uganda as in many other African countries, such as bovine Tuberculosis (TB), rabies, bovine and swine cysticercoses, hydatidosis, toxoplasmosis that can be transmitted from animals or their products to humans (Bisson et al., 2000). Apart from being significant health hazards, zoonoses are associated with high economic losses through condemnation of animals and animal products at inspection points (MAAIF, 2001). In addition, certain animal rearing practices like pastoralism result in closer association of family members with animals including sharing the same sleeping quarters, a practice that
exposes the people to zoonotic diseases the animals might be shedding or carrying such as ringworm, hydatid disease, cryptosporidia among others (MAAIF, 2001). An indirect effect to human health occurs when infections and parasitic diseases of livestock may kill the animals outright, may necessitate their destruction, or may reduce the survivors' production of meat or milk, all of which can in turn reduce the food supply available to humans (Waltner-Toews, 2001). Such diseases are obviously an obstacle to international trade, as well as a serious financial drain on livestock owners, and more generally, on the economy of a community or country - an impact which may have broad repercussions for health and thus poverty in a society. Recent outbreaks of African Swine Fever (ASF) in west Africa that swept through the pig populations kept by the poor as a means of overcoming poverty are a typical example (Nipah, 2000). ASF outbreaks do occur Uganda and were recently reported from southern part of the country in 2000/2001.

As consumers, approximately 72% and 25% of the rural population in Uganda depend on well and surface water, respectively, for drinking and domestic use (Uganda, 2001). However, surface water in swamps and ponds being communal water sources are commonly shared with other livestock, especially cattle, sheep and goats. The communities might not be aware that fouling of these surface waters by livestock may expose the poor to zoonotic diseases such as giardiasis, leptospirosis, cryptosporidiosis, and salmonellosis. This is because the poor are more likely to consume this water without any further treatment (e.g. boiling).

**Conclusion**

In developing countries, however, the surveillance infrastructure is weak or absent and laboratory resources and skills may be scarce (Schlundt, 2002). This is certainly the case in Uganda where the food control system is inadequate. Proper sanitary control of animals, meat and milk in Uganda is still low, especially in the peri-urban areas and the countryside partly due to inadequate numbers of trained veterinarians in the country and probably also due to absence of continued veterinary programs. A number of meat inspectors employed by municipal and local authorities have had little training in meat inspection and food safety in general. For example in 1999, a study in Mukono district involving 1400 heads of cattle, over 60% of food animals that died from various causes were eaten and only 1.4% were found to have undergone veterinary inspection (Koma - personal communication). Anecdotal information also suggests that the poor are not likely to slaughter a healthy animal for food. This situation obviously poses a great risk for foodborne diseases (FBDs) to the consuming public, especially with zoonooses such as cysticercoses, brucellosis and TB. Compounding the problem is that there is little data on the magnitude of zoonoses including FBDs in Uganda largely because of lack of a monitoring and surveillance system for these diseases in place.

Although the role of the veterinary profession in public health has gained momentum in some countries like the USA as a result of major outbreaks of once controlled infectious agents and emergence of new ones in the late 1980s (Chomel, 1998), this has yet to happen in Uganda and other developing countries. Belino (1992) observed that by the end of the last century, many African countries had not integrated VPH into the mainstream of public health services. Fortunately, Uganda has within the Ministry of Health, a section of VPH. This section, however, is understaffed and there appears to be no substantial effort to strengthen it. Although public health veterinarians should be fully involved and comprise teams to investigate outbreaks of emerging or re-emerging zoonoses, this integration between the medical and veterinary field is still lacking as evidenced in the recent outbreak of Ebola haemorrhagic fever in Uganda that affected 425 people, mainly the rural poor with a case fatality rate of 53% (WHO, 1999). The renewed interest and activities in VPH globally should prioritize increased international collaboration between developed and developing countries in food safety, animal and human health that may lead to the improvement of the economies of the poor countries. There is also need for intersectoral cooperation within the country in surveillance of diseases of public health significance since these diseases are believed to contribute significantly to the burden of disease today, especially among the poor.

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【症例報告】

ウガンダ国の貧困緩和に貢献できる獣医公衆衛生の役割

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要約
ウガンダの貧しい家庭では、家畜は、富の象徴であり、また動物性蛋白質および収入の源としても重要な価値がある。このように、家畜を飼育することによる利益は明らかであるが、また一方で、生産者かつ消費者である貧しい人々が、家畜を媒介として病気に感染するという負の効果を忘れてはならない。つまり、貧しい人々は、家畜や畜産物と接触することにより、知らないうちにトリバノゾーマ病、結核、狂犬病などの、経済的にも公衆衛生学的にも重要な病気に感染してしまう危険にさらされているのである。このようなことが起こる一番の原因は、ウガンダや世界の多くの国々で獣医公衆衛生の重要性がまだ十分に理解されておらず、国の公衆衛生事業においても獣医公衆衛生活動が適切に組み込まれていないからである。本論文では、ウガンダの貧困問題に焦点をあてながら、公衆衛生事業全般における獣医公衆衛生の本来あるべき役割について述べる。