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A commentary on occupational infectious diseases due to agricultural practices in Sub-Saharan Africa

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ABSTRACT

Occupational diseases associated with agricultural practices in Sub-Saharan Africa have a major health impact on farmers, farm workers and their families. This leads to reduced productivity through decreased human and livestock resource and places an additional burden on health care requirements in already poor areas. An in-depth knowledge of the various diseases and potential risks associated with farming in SSA could provide insights on effective control measures. This paper presents a review of infectious disease in farmers in Sub-Saharan Africa likely to have been contracted as a result of farming practices. The following are considered: Sources, modes of transmission, incidence, prevalence, morbidity and mortality. Infections have been classified into those of bacterial, parasitological, mycological and virological origin. The literature indicates that 80% of cases of occupational diseases due to farming with high morbidity and mortality are from helminths, protozoa and bacterial infections. More effective reporting of disease, risk awareness and appropriate intervention methods, are required to tackle the occurrence of occupational diseases amongst farmers in Sub-Saharan Africa.

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1. Introduction

Sub-Saharan Africa (SSA) has over 300 million poor livestock farmers, and 36% of the population in East Africa is livestock keepers. Infectious diseases have contributed substantially to undermining the health status of people and jeopardizing the economic development of nations in SSA [1,2]. Despite notable examples of success in campaigns to eradicate and control specific diseases in tropical Africa, many remain prevalent. This is due to the combined effects of suitable ecological and climatic factors on the causative microorganisms and their

vectors, human behavioural practices, customs, traditions, development of drug resistant microbial strains, and the socioeconomic conditions that prevail in Africa [3,4]. It has been estimated that the World Health Organization (WHO) spends more than 25% of its budget on the control and treatment of infectious diseases [4]. Limitations to sanitation facilities and manure management strategies, resulting in poor and declining water quality and environmental burdens of infectious organisms, remain unresolved [4–6].

Despite numerous studies on the epidemiology, pathogenesis, immunology and chemotherapy of infectious disease, the picture across Africa remains unclear [1,2]. The WHO estimates

Abbreviations: SSA, Sub-Saharan Africa; WHO, World Health Organization.

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Table 1 – Common diseases which show an association with farming in Sub-Saharan Africa, and some key on-farm approaches to reduce infection. Modified from Refs. [19–26]. Manure management refers to activities such as piling, composting or biogas digestion of manures; hygiene refers to hand and skin washing; protection refers to wearing shoes, long sleeved shirts, dust masks etc.; biting insect control refers to larger scale organized activities or on-farm strategies.

Reason for agricultural occupational risk	Major reservoirs and primary sources	Pathway of infection	Route of entry into human ^a	Organism type	Organism name	Disease	Key mitigation strategies relating directly to farming practices
Animal contact and proximity	Human and animal faeces	Faeco-oral – commonly water and environmental contact	I	Protozoa	<i>Giardia lamblia</i>	Giardiasis (gastroenteritis)	Manure management Keep animal separate from human living areas
Animal contact and proximity	Human and animal faeces	Faeco-oral – commonly water and food	I	Protozoa	<i>Entamoeba histolytica</i>	Amoebic dysentery	Manure management Keep animal separate from human living areas
Proximity to water	Human	Vector borne (Tsetse Fly)	B	Protozoa	<i>Trypanosoma</i> spp.	Human African Sleeping sickness	Biting insect control or protection
Proximity to animal reservoir	Wild and domestic animals, humans	Vector borne (Sand Fly)	B	Protozoa	<i>Leishmania</i> spp.	Leishmaniasis Kala Azar	Biting insect control or protection Keep animal separate from human living areas
Animal contact and proximity	Animals (cat)	Faeco-oral – animal contact/ environmental contact	I	Protozoa	<i>Toxoplasma gondii</i>	Toxoplasmosis	Hygiene Keep animal separate from human living areas
Exposure to environment	Soil, dust, air water	Environmental contact	I,S,E	Protozoa	<i>Acanthamoeba castellani</i>	Granulomatous amebic encephalitis; keratitis	Protection Hygiene
Animal contact and proximity	Pig	Faeco-oral, often via water	I	Protozoa	<i>Balantidium coli</i>	Balantidiasis	Manure management Keep animal separate from human living areas
Animal contact and proximity	Human and animal faeces	Water borne	I	Protozoa	<i>Cryptosporidium</i> spp.	Cryptosporidiosis	Manure management Keep animal separate from human living areas
Animal attraction of flies which spread disease	Human	Person to person contact, shared towels, flies	E	Bacteria	<i>Chlamydia trachomatis</i>	Active trachoma (eye infection & blindness)	Fly control Keep animal separate from human living areas
Animal contact and proximity	Animal urine; faeces, dried placental material (cattle, sheep, goats); milk;	Animal or environmental contact	I	Bacteria	<i>Coxiella burnetii</i>	Q fever	Manure management Keep animal separate from human living areas

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