Characterization of Brucellosis and its effect on livestock productivity in Kyrgyzstan

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Key words
Brucella melitensis, Kyrgyzstan, cattle, sheep, goat, cost of disease

Aim of the study
Brucellosis is a disease of livestock which is transmissible to human and thus of major public health concern. Kyrgyzstan has one of the highest brucellosis incidence worldwide (Annual Incidence: 74 per 100 000 in 2007). An increase of the disease has been reported since the end of Soviet Union. Currently the donor community is concerned that operations are strategically planned and effectively reduce the occurrence and the burden of this disease in humans and animals. However, prior to embarking on mass interventions, the profitability and cost-effectiveness should be assessed and the circulating Brucella strains should be known. This project aimed at understanding circulating Brucella strains and the cost of disease of Brucellosis to Kyrgyzstan.

Material and methods
As part of a representative cross-sectional study of Brucellosis sero-prevalence in cattle, sheep, goat and humans, Brucella strains were isolated and characterized by molecular and mass-spectrometry techniques in collaboration with Labor Spiez and the Cantonal Microbiological Laboratory in Bellinzona. Further, an assessment of the cost of Brucellosis to the Kyrgyz society was undertaken using methods previously developed for Mongolia (Roth et al. BWHO 2003).

Results and significance
The first seven Brucella strains isolated from livestock were all *Brucella melitensis*. One strain was found in cattle, all others were from sheep. VNTR typing showed a very high homogeneity between strains and indicate likely transmission between sheep and cattle. MALDI-TOF mass spectrometry confirmed the high homogeneity of the isolated strains. All strains were fully susceptible to all tested antibiotics Trimethoprim-sulfamethoxazole Gentamicin, Rifampin, Ofloxacin, Streptomycin, Doxycycline and Ciprofloxacin. These findings have important public health implications. Further strains are collected and will contribute to the understanding of the circulating Brucella strains. Preliminary cost estimates were made using the FAO Livestock Development Planning System by assuming a 15% loss of fertility and milk production (cattle) in sero-positive ruminants. Human health cost information was provided by official sources. Annual social and private health costs are estimated at least at 23 Mio SOM (0.6 Mio US$). Annual losses to the livestock sector are estimated at 360 Mio SOM (10 Mio US$). Considering variability of parameters and pending a full sensitivity analysis the range of annual losses for the country is estimated at 180-540 Mio SOM (5-15 Mio US$). During a regional workshop (June 2008 in Koi-Tash), results were presented and discussed with participants from Mongolia, Kazakhstan, Uzbekistan, Tajikistan, Kyrgyzstan, United States, Africa and Switzerland.

Publications, posters and presentations
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