

## Brucellosis in Pakistan: a neglected zoonotic disease

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### Abstract

Brucellosis is a zoonotic disease; endemic but neglected in the South Asian countries including Pakistan. It causes economic loss to the livestock sector and leads to systemic infection in humans. Brucellosis was neglected in Pakistan since long. According to the Staged Tool for the Elimination of Brucellosis (STEB), Pakistan carries a grim landscape of the disease with no structured control activities. This article describes the five-year national brucellosis control strategic plan (2018-2023) formulated by the government of Pakistan using the one-health approach for the prevention and control of disease across the country. The plan incorporates components of surveillance, research, diagnostic capacity, awareness and vaccination using a multi-disciplinary approach.

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### Introduction

Brucellosis is a bacterial zoonotic disease primarily affecting cattle, sheep, horses, camels, buffaloes and dogs which can be transmitted to humans accidentally. It is among the neglected zoonotic diseases, predominantly affecting the marginalized and poor populations.<sup>1</sup> Pakistan is faced by the double burden of disease. National estimates for burden of brucellosis in humans are not available. However, all South Asian countries are labelled as “possibly endemic” for brucellosis, as disease is present in animals.<sup>2</sup> Brucellosis is ranked second among the six priority zoonotic diseases in Pakistan.<sup>3</sup>

Animals affected by brucellosis suffer from reproductive problems such as abortions, still-birth, decreased milk production and infertility. Brucellosis can be transmitted to humans directly via inoculation of the infected animal secretions (blood, urine, milk, semen, saliva, placenta) through cuts and abrasions in the skin or mucous membranes such as the conjunctival sac of the eyes. It can also be transferred by eating or drinking contaminated animal products (un-pasteurized milk, raw meat) and inhaling air-borne agents. Thus butchers, slaughter house

workers, meat packing employees, livestock producers, milkmen, veterinarians, clinicians and laboratory personnel are particularly at risk. Brucellosis leads to systemic infection and presents with vague symptoms in humans which includes fever, chills, night sweats, fatigue, anorexia and joint pains. Brucellosis is frequently misdiagnosed and leads to sacroiliitis, osteomyelitis, bursitis, spondylitis, orchitis, and endocarditis. Mortality is rare.

There is dearth of literature assessing the burden of brucellosis in Pakistan. Few studies determining the prevalence of animal brucellosis estimate that it is 6 to 21% among cattle.<sup>2,4-6</sup> Human brucellosis is common in Pakistan, with estimates ranging from 3% in the general population, 6% in the pregnant females and up-to 22% among the high risk groups.<sup>7-9</sup>

A Staged Tool for the Elimination of Brucellosis (STEB) has been developed by CDC (Center for Disease Control) as an instrument to assess and evaluate a country's capacity to control and eliminate brucellosis. The relevant data is entered into STEB; giving the landscape of the country in terms of five stages pertaining to the control of brucellosis. Stage one indicates no current capacity to control brucellosis, stage two refers to a known disease situation and planned control programmes, countries fall in stage three if the control programmes are underway, brucellosis at low levels of occurrence or transmission pertains to stage four and stage five indicates freedom from livestock-endemic brucellosis. The tool was applied to assess the landscape of Pakistan and illustrated a stage of 1-1.5; highlighting the unknown situation of the disease with no structured control activities.

Challenges to control brucellosis in Pakistan include the absence of regular surveillance of zoonotic diseases and the investigation is event based. Moreover, the data is not shared among the livestock, agriculture, environment and public health departments for concerted action. The diagnostic capacity does not exist at primary and secondary levels to detect brucellosis. Lastly, there is lack of awareness in the communities and among the health care professionals leading to frequent mis-diagnosis.

In view of the grim situation, a national brucellosis control strategic draft has been developed by the ministry of national health services, regulations and coordination, national institute of health, ministry of national food

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security and research, ministry of climate change, provincial health, livestock and environmental departments in collaboration with CDC. The brucellosis control strategic plan aims to build the national and provincial capacity for prevention and control of the disease using a one-health approach and will be implemented from 2018 to 2023. According to the blueprint, animal brucellosis will be controlled by tagging of animals, maintaining animal registries and health cards followed by vaccination campaigns and implementation of farm biosecurity principles. Training and awareness material for veterinarians, physicians and the general public will be developed for preventing human brucellosis. Moreover, research for the identification of circulating brucella species will be carried out in animals and humans. The diagnostic capacity and surveillance for brucellosis will be strengthened at the central, provincial and regional levels along with the establishment of epidemiological units. Networking and coordination among human and animal laboratories will be promoted for sharing data. Finally, a one-health policy will be formulated and adapted at the national and provincial levels. Addressing this disease requires cross-sectoral collaborative efforts of human and animal health systems and a multi-disciplinary approach that considers the complexities of the eco-systems where humans and animals co-exist. It is now for the relevant stakeholders to ensure the implementation of the plan in order to bring about an encouraging impact in

the next five years.

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