Unravelling the burden of parasitic zoonoses in Nepal

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Conclusions

In settings with **limited surveillance capacity**, it is possible to quantify the health impact of parasitic zoonoses (PZ) and other neglected diseases by applying **various statistical methods**, thereby unraveling the burden of these diseases and interrupting the vicious circle of neglect.

Keywords

Disease burden; Nepal; Parasitic zoonoses.

Figure 1. Data mining in Nepal. Given the limited availability of electronic databases, data had to be collected manually.

Background

Parasitic zoonoses (PZ) pose a significant but often neglected threat to public health, especially in developing countries.[1]

In order to get a better understanding of their health impact, summary measures of population health may be calculated, such as the **Disability-Adjusted Life Year** or **DALY-metric**.[2]

However, the data required to calculate such measures are often not readily available for these diseases, which may lead to a **vicious circle** of underrecognition and underfunding.

Methodology

We reviewed the burden of parasitic zoonoses in **Nepal**, one of the poorest countries in the world.

Figure 2. Nepal, a South Asian country bordered by India and China

The review process took place in two phases:

1. A **qualitative** assessment to identify the endemic PZ and available data, and;
2. A **quantitative** health impact assessment expressed in terms of DALYs.

Since no PZ are included in the current lab-based surveillance systems, a **comprehensive collection** of online and offline data sources was conducted, and **various statistical methods** were applied to these data sources, including meta-regression, predictive modeling, stochastic simulation, and data extrapolation.

Preliminary results

Based on the first qualitative assessment, a **classification** of PZ could be made:

Endemic (quantitative data)	Probably endemic (no quantitative data)	Probably not endemic (no data)
Echinococcus granulosus	*Echinococcus multilocularis*	*Angiostrongylus* spp.
Intestinal protozoa	Foodborne trematodes	*Anisakis* spp.
Intestinal helminths	*Leishmania major*	*Capillaria philippinensis*
Taenia solium - NCC	*Toxocara* spp.	*Diphyllobothrium* spp.
Taenia spp. - taeniosis	*Trichinella* spp.	*Trypanosoma cruzi*
Toxoplasma gondii		

Based on published DALYs per case and preliminary incidence estimates, the endemic PZ for which sufficient quantitative data were available could be **ranked** according to their importance:

Rank	Endemic PZ
1	*Toxoplasma gondii*
2	*Taenia solium* neurocysticercosis
3	Intestinal protozoa
4	*Echinococcus granulosus*
5	Intestinal helminths
6	*Taenia* spp. taeniosis

Figure 3. Free-ranging pigs in southeastern Nepal. This practice promotes the occurrence of the pork tapeworm, *Taenia solium*, one of the most important zoonotic parasites in Nepal.

Discussion

In Nepal, we found that several PZ are endemic and are imposing a **not insignificant burden** to public health; however, still several **critical data gaps** could be identified.

As **effective surveillance systems** are key to any public health intervention, these systems should be promoted in developing countries such as Nepal, as these countries are affected the most by PZ and other neglected diseases.

The quantitative assessments will be worked out in the near future, and should lead to health impact quantifications in terms of DALYs, with corresponding uncertainty intervals.

References

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