

# Social determinants of health and the double burden of infectious and non-communicable disease in Nepal

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## Abstract

### Background

As the global burden of disease evolves, lower-resource countries like Nepal face a double burden of non-communicable and infectious disease. Rapid adaptation is required for Nepal's health system to provide chronic, person-centred care at the same time as improving the quality of infectious disease services. Social determinants of health play a key role in addressing health disparities and could direct policy decisions to promote health and manage the disease burden. Thus we explored the association of social determinants with the double burden of disease in Nepal.

### Methods

This is a retrospective, ecological, cross-sectional analysis of infectious and non-communicable disease outcome data (2017 to 2019) and data on social determinants of health (2011 to 2013) for 753 municipalities in Nepal. Multinomial logistic regression was conducted to evaluate the associations between social determinants and disease incidence.

### Results

'High-incidence' of non-communicable disease was associated with more urban municipalities (adjOR1.40[95%CI1.07-1.82]), higher proportions within the municipality of females (adjOR1.69E8[95%CI3227.74-8.82E12]), nutritional deficiency (adjOR1.39E17[95%CI11899.80- 1.64E30]) and malnutrition (adjOR2.17E131[95%CI4.41E79-1.07E183]) and lower proportions of population under five years (adjOR1.05E-10[95%CI9.95E-18-0.001]), indigenous population (adjOR0.32[95%CI0.11-0.91]), average people per household (adjOR0.44[95%CI0.26-0.73]) and no piped water (adjOR0.21[95%CI0.09-0.49]), compared to the 'low-incidence' category on adjusted analysis. 'High incidence' of infectious disease was also associated with more urban municipalities (adjOR4.29[95%CI1.56-2.57]), higher proportions of population under five years (adjOR21377456.47[95%CI2006.54-2.67E11]), vaccine coverage (adjOR25.42[95%CI7.85-82.29]) and malnutrition (adjOR4.29E41[95%CI12408.29-1.48E79]) and lower proportions using firewood as fuel (adjOR0.39[95%CI0.20-0.79]) ('moderate-incidence' category only) compared to 'low-incidence'. The 'high-incidence' combined double burden (non-communicable and infectious disease) outcome was associated with more urban municipalities, (adjOR3.14[95%CI2.29-4.31]), higher proportions of absentee population (adjOR811.25[95%CI5.30-12.41E4]), firewood use (adjOR3.11[95%CI1.28-7.52]), vaccine coverage (adjOR14.00[95%CI4.23-46.34]) and malnutrition (adjOR1.61E145[95%CI1.29E86- 2.01E204]) and lower average number of people per household (adjOR0.59[95%CI0.42-0.83]) compared to the 'low-incidence' category on multivariate analysis.

### Conclusions

While this study produced imprecise estimates and cannot be interpreted for individual risk, more urban municipalities were consistently associated with higher disease incidence than smaller, more remote areas. Female sex, nutritional deficiency and malnutrition were also associated with higher incidence of disease and offer targets to direct interventions in order to reduce the incidence of infectious and non-communicable disease and manage the double burden of disease in Nepal.