Tracking Regional Variation in Healthcare
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Abstract

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Title
Determinants of shape and size of general practitioners' catchment areas in a rural area of Germany

Background
Health supply planning aims to ensure population-wide access to general practitioners (GPs), while at the same time taking into account GP burden. This requires information on existing GP catchment areas and the factors determining their regional extension. In Germany, individual health care utilization data for small-area regional analysis is not available because of data protection laws.

Objectives
This study asked GPs in a rural area of Germany to estimate their catchment areas, and examined factors that determine their shape and size.

Methods
From March to June 2013, 179 rural GPs were asked for practice information and invited to draw their main primary care catchment area on an individualized map showing their practice. Auxiliary services such as chirotherapy and acupuncture were excluded. Using a geographical information system (QGIS), the shape of the estimated catchment area was visually compared with a polygon created according to road accessibility to the practice, and determinants of any deviation were identified. Predictors of estimated catchment area size were assessed using linear regression analysis.

Results
The responses from 40 GPs were eligible for analysis. The participating GPs were 55 ± 7 years old and 78 % male (n=38). GPs reckoned their practices to have 1498 ± 819 patients per quarter (n=37). The mean estimated catchment area accounted to 130 ± 86 km^2 (median 117 km^2, n=40). Visually, the shapes of the catchment areas appeared to be influenced by physical structures such as rivers and forests as well as the surrounding road network, and showed multiple overlaps. Catchment area size was predicted by both the number of patients in the practice (ß= .365; p=0.015) as well as the number of GPs located 5 to 10 kms away from the respective GPs' practice (-.399, p=0.008). Corrected R^2 for the model amounted to .278.

Conclusion/Discussion/Policy Perspective

Our approach of estimating the catchment area by GPs themselves allowed for studying determinants of regional extension. Especially the number of other GPs located 5 to 10 kms away and physical structures seemed to have an influence on shape and size of individual catchment areas. This might be relevant as with further decrease in rural GP number, both size of catchment area and respective patient population might increase with both the risk of non-manageable work burden for the remaining GPs and critical access for vulnerable population groups. Indices for borderline catchment area size should be investigated e.g. by evaluating whether increasing area size is associated with decreased delivery of home visits by GPs. The identified determinants of the shape and size of GP catchment areas should be implemented in future studies that aim to optimize practice location planning.