

Article title: Characteristics of Medical Deserts and Approaches to Mitigate Their Health Workforce Issues: A Scoping Review of Empirical Studies in Western Countries

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Supplementary file 3. Excluded Studies and Reasons for Exclusion

Number	1st author	year	title	Reason for exclusion
1	Al Saffer, Q.	2021	The capacity of primary health care facilities in Saudi Arabia: infrastructure, services, drug availability, and human resources	wrong population
2	Alameddine, M.	2016	Upscaling the recruitment and retention of human resources for health at primary healthcare centres in Lebanon: a qualitative study	wrong population
3	Alvi, R.	2011	Experience of developing rural surgical care in a remote mountainous region of Pakistan: Challenges and opportunities	wrong population
4	Ament, L. A.	1991	The integration of a QA/RM program in a rural healthcare obstetrical service	wrong publication type
5	Averill, J.B.	2006	Getting started: initiating critical ethnography and community-based action research in a program of rural health studies	wrong publication type

Number	1st author	year	title	Reason for exclusion
6	Ayaz, A.	2014	Brain drain human resources and human capital growth in Pakistan: a political and economical perspective	wrong population
7	Badanta-Romero, B.	2021	Cuidados enfermeros para el abordaje de la salud comunitaria en poblaci3n ind3gena de la Amazonia peruana	foreign language
8	Bahadori, M.	2012	Classification of health structural indicators using scalogram model in Golestan province, northern Iran	wrong population
9	Bamberg, R.	1994	The development of a state-level health manpower database using an employer-based survey: A pilot project	Not medical desert
10	Bärnighausen	2009	Financial incentives for return of service in underserved areas: A systematic review	wrong publication type
11	Barzola-Cordero, V.	2011	Implementation of medical specialists' brigades in the areas of Universal Health coverage: The Peruvian Ministry of Health experience, 2009-2010	wrong population
12	Batura, N.	2016	Is the Job Satisfaction Survey a good tool to measure job satisfaction amongst health workers in Nepal? Results of a validation analysis	wrong population
13	Benskin, L. L. L.	2012	A Concept Development of the Village Health Worker	wrong publication type
14	Berke, E. M.	2009	Practical and policy implications of using different rural-urban classification systems: A case study of inpatient service utilization among veteran administration users	wrong population
15	Bertrand , W. E.	1979	Attitudinal classification of health manpower in Colombia: A research note on urban/rural differences in occupational prestige	wrong population
16	Bhan, N.	2020	Access to women physicians and uptake of reproductive, maternal and child health services in India	wrong population
17	Brahmapurkar, K. P.	2018	The need to focus on medical education in rural districts of India	wrong population
18	Breindel, C. L.	1981	Marketing strategies in rural areas	wrong publication type
19	Brown, M. C.	1994	Using Gini-style indices to evaluate the spatial patterns of health practitioners: Theoretical considerations and an application based on Alberta data	wrong publication type
20	Brown, P.	2016	Place matters	wrong publication type
21	Bryant M.	1995	Measuring time utilization in rural health centres	wrong population
22	Burrows, G.	2019	What are the support needs of nurses providing emergency care in rural settings as reported in the literature? A scoping review	wrong publication type
23	Cancedda, C.	2014	Enhancing formal educational and in-service training programs in rural Rwanda: A partnership among the public sector, a nongovernmental organization, and Academia	wrong population
24	Carson, D. B.	2016	Recruitment and retention of professional labour: the health workforce at settlement level	wrong publication type
25	Casey, M. M	1997	Rural health network development: Public policy issues and state initiatives	wrong publication type
26	Celletti, F.	2010	Can the deployment of community health workers for the delivery of HIV services represent an effective and sustainable response to health workforce shortages? Results of a multicountry study	wrong population

Number	1st author	year	title	Reason for exclusion
27	Cheek, C.	2017	Building a local medical workforce in Tasmania: where are international fee-paying medical graduates likely to work?	wrong population
28	Cheek, C.	2019	Building a medical workforce in Tasmania: A profile of medical student intake	wrong population
29	Chen, F.	2015	Analysis of the equity of public health resources allocation in Chongqing from the perspective of migration	wrong population
30	Chowdhury, M.	1998	The role of traditional birth attendants in a safe delivery programme in Bangladesh	wrong population
31	Colagiuri, R.	2006	Building capacity to reduce diabetes complications in the Pacific: The Vanuatu experience so far	wrong population
32	Collins, C.	2016	Challenges of Recruitment and Retention in Rural Areas	wrong publication type
33	Cossmann, J.	2017	The differential effects of rural health care access on race-specific mortality	not HWF
34	Curry, L. A.	2012	Community perspectives on roles and responsibilities for strengthening primary health care in rural Ethiopia	wrong population
35	Dayrit, M. M.	2011	Addressing the Human Resources for Health crisis in countries: How far have we gone? What can we expect to achieve by 2015?	wrong population
36	DeFriese, G. H.	1981	An agenda for health services research in primary care	wrong publication type
37	Deng, F.	2017	Expanding public health in China: an empirical analysis of healthcare inputs and outputs	wrong population
38	Dhingra, B.	2011	National rural health mission	wrong population
39	Dhungel, B.	1988	Planning for rural health services in Nepal	wrong population
40	Dodson, Z. M.	2017	How to allocate limited healthcare resources: Lessons from the introduction of antiretroviral therapy in rural Mozambique	wrong population
41	Dolea, C.	2010	Evaluated strategies to increase attraction and retention of health workers in remote and rural areas	wrong publication type
42	Dong, E.	2020	Differences in regional distribution and inequality in health-resource allocation at hospital and primary health centre levels: A longitudinal study in Shanghai, China	wrong population
43	Drennan, V. M.	2019	Global nurse shortages - The facts, the impact and action for change	wrong population
44	Duarte-Gómez, M. B.	2015	Social determinants of infant mortality in socioeconomic deprived rural areas in Mexico	wrong population
45	Eley, D. S.	2007	Will Australian rural clinical schools be an effective workforce strategy? Early indications of their positive effect on intern choice and rural career interest	wrong publication type
46	El-Jardali, F.	2013	A national study on nurses' retention in healthcare facilities in underserved areas in Lebanon	wrong population
47	Erchick, D. J.	2020	Feasibility of training community health workers to conduct periodontal examinations: a validation study in rural Nepal	wrong population
48	Erdenee, O.	2017	Distribution of health care resources in Mongolia using the Gini coefficient	wrong population

Number	1st author	year	title	Reason for exclusion
49	Erickson, J. S.	2011	Rural medical education in the WWAMI region: instituting a rural longitudinal medical school curriculum in association with a rural longitudinal integrated community clerkship experience	wrong publication type
50	Fang, P.	2010	Regional inequality in health and its determinants: Evidence from China	wrong population
51	Fang, P.	2014	Factors that influence the turnover intention of Chinese village doctors based on the investigation results of Xiangyang City in Hubei Province	wrong population
52	Farmer, J.	2015	A scoping review of the association between rural medical education and rural practice location	wrong publication type
53	Farmer, J. C.	2001	Rural deprivation: Reflecting reality	wrong publication type
54	Federal register	2002	Medicare program	wrong publication type
55	Francis, J. R.	2020	Disparity in distribution of inpatient hospital services in Australia	wrong publication type
56	Freeman, R.	2013	Dental therapists/hygienists working in remote-rural primary care: A structured review of effectiveness, efficiency, sustainability, acceptability and affordability	wrong publication type
57	Fujiwara, K.	2016	Trends for the Geographic Distribution of Radiological Resources in Hokkaido, Japan: Data Analysis Using Gini Coefficient and Herfindahl-Hirschman Index	wrong population
58	Gajewski, J.	2019	The contribution of non-physician clinicians to the provision of surgery in rural Zambia-a randomised controlled trial	wrong population
59	Ghosh, S.	1979	Primary health care for developing countries	wrong publication type
60	Gibson, O. R.	2013	A systematic review of evidence on the association between hospitalisation for chronic disease related ambulatory care sensitive conditions and primary health care resourcing	not HWF
61	Giovanella, L.	2017	Comprehensive primary care and segmented health systems in South America	wrong population
62	Giraldo Molina, C. I.	2000	Nursing care needs: criteria to define nursing personnel requirements	wrong publication type
63	Godwin, D.	2014	Dental practitioner rural work movements: a systematic review	wrong publication type
64	Greer, T. M.	2011	Addressing Disparities in Rural Health	wrong publication type
65	Greiner, D.S.	2008	Rural health nursing research review: global perspectives	wrong publication type
66	Grobler, L.	2015	Interventions for increasing the proportion of health professionals practising in rural and other underserved areas	wrong publication type
67	Gross, J. M.	2010	The impact of an emergency hiring plan on the shortage and distribution of nurses in Kenya: The importance of information systems	wrong population
68	Hagopian, A.	2012	Applying WHO's 'workforce indicators of staffing need' (WISN) method to calculate the health worker requirements for India's maternal and child health service guarantees in Orissa State	wrong population
69	Han, Y.	2012	Accessibility of primary health care workforce in rural China	wrong population

Number	1st author	year	title	Reason for exclusion
70	Hatam, N.	2015	Distribution of health resource allocation in the Fars province using the scalogram analysis technique in 2011	wrong population
71	Hays, R.	2017	Interpreting rural career intention in medical workforce research	wrong publication type
72	Hays, R. B.	2007	Rural medical education in Europe: the relevance of the Australian experience	wrong publication type
73	Hays, R. B.	1998	Methodological issues in medical workforce analysis: implications for regional Australia	wrong publication type
74	Hermawan, A.	2019	Health Workforce Distribution (Physicians, Nurses Midwives) Analysis in Indonesia 2013 by Gini Index	foreign language
75	Higgins-Steele, A.	2015	Peer-driven quality improvement among health workers and traditional birth attendants in Sierra Leone: linkages between providers' organizational skills and relationships	wrong population
76	Hsu, Y. E.	2016	Measuring inequality in physician distributions using spatially adjusted Gini coefficients	wrong population
77	Humphreys, J.	1999	Rural health status: what do statistics show that we don't already know?	wrong publication type
78	Hunter, D.	2009	Boundaries of the health workforce: definition and classification of health workers	wrong publication type
79	Irel , M	2016	Expanding the primary health care workforce through contracting with nongovernmental entities: the cases of Bahia and Rio de Janeiro	wrong population
80	Ishikawa, T.	2017	Forecasting the regional distribution and sufficiency of physicians in Japan with a coupled system dynamics-geographic information system model	wrong population
81	Judd, F. K. (2001	Improving access for rural Australians to treatment for anxiety and depression: the University of Melbourne Depression and Anxiety Research and Treatment Group â€	wrong publication type
82	Kadam, S.	2016	A study of organizational versus individual needs related to recruitment, deployment and promotion of doctors working in the government health system in Odisha state, India	wrong population
83	Kashima, S.	2014	Non-physician communities in Japan: are they still disadvantaged?	wrong population
84	Kebriaei, A.	2009	Job satisfaction among community health workers in Zahedan District, Islamic Republic of Iran	wrong population
85	Kelman, I.	2020	Linking Disaster Risk Reduction and Healthcare in Locations with Limited Accessibility: Challenges and Opportunities of Participatory Research	not HWF
86	Kerr, L	2021	Rural emergency departments: a systematic review to develop a resource typology relevant to developed countries	wrong publication type
87	Knippenberg, R.	1997	Implementation of the Bamako initiative: Strategies in Benin and Guinea	wrong population
88	Kolehmainen-Aitken, R. L.	1990	'Indicators of staffing need': Assessing health staffing and equity in Papua New Guinea	wrong population
89	Leight, S.B.	2003	To describe the application of the vulnerable populations conceptual model to rural health	wrong publication type
90	Leonfanti, F. L.	1988	Neuquen, Argentina: Provincial health policies and their results	wrong population
91	Lin, S. W.	2015	New indices for home nursing care resource disparities in rural and urban areas, based on geocoding and geographic distance barriers: a cross-sectional study	wrong population

Number	1st author	year	title	Reason for exclusion
92	Liu, T.	2020	Regional Differences and Influencing Factors of Allocation Efficiency of Rural Public Health Resources in China	wrong population
93	Liu, W.	2019	Health expenditure efficiency in rural China using the super-SBM model and the Malmquist productivity index	wrong population
94	Lohmann, J.	2019	Psychological wellbeing in a resource-limited work environment: examining levels and determinants among health workers in rural Malawi	wrong population
95	Lourenco, A. E. P.	2012	The meaning of 'rural' in rural health: A review and case study from Brazil	wrong population
96	Lysdahl, K. B.	2007	Geographical variation in radiological services: a nationwide survey	not HWF
97	Martiniuk, A. L.	2020	Capability ... what's in a word? Rural Doctors Network of New South Wales Australia is shifting to focus on the capability of rural health professionals	wrong publication type
98	Matsumoto, M.	2013	Do rural and remote areas really have limited accessibility to health care? Geographic analysis of dialysis patients in Hiroshima, Japan	wrong population
99	Mbemba, G.	2013	Interventions for supporting nurse retention in rural and remote areas: an umbrella review	wrong publication type
100	McGrail, M. R.	2009	Geographical classifications to guide rural health policy in Australia	wrong publication type
101	McGrail, M. R.	2017	Index of access: a new innovative and dynamic tool for rural health service and workforce planning	wrong publication type
102	Mills, J.	2010	The status of rural nursing in Australia: 12 years on	wrong publication type
103	Millsteed, J.	2000	Issues affecting Australia's rural occupational therapy workforce	wrong publication type
104	Morelli, V.	2017	An Introduction to Primary Care in Underserved Populations: Definitions, Scope, and Challenges	wrong publication type
105	Morelli, V.	2019	Primary Care in Underserved Populations Definitions, Scope, Challenges and Future Considerations	wrong publication type
106	Moyo, S.	2018	Application of machine learning models in predicting length of stay among healthcare workers in underserved communities in South Africa	wrong population
107	Muhammad, K.	2014	Assessment of health workforce providing maternal neonatal child health services at primary health care level of Sanghar, Sindh	wrong population
108	Mulcahy, A. J.	2010	The impact of recent physiotherapy graduates in the workforce: a study of Curtin University entry-level physiotherapists 2000â€“2004	Not medical desert
109	Murphy, G.T.	2012	Research to action: an evaluation	Not medical desert
110	Nancarrow, S. A.	2005	Dynamic professional boundaries in the healthcare workforce	wrong publication type
111	Nelofer, A.	2013	Incentives scheme can be both beneficial & counterproductive: a systematic review of efficacy and values of health workers' incentives in health sector	wrong population
112	Nicholson, L. A.	2008	Rural mental health	wrong publication type
113	Nishiura, H.	2004	Health inequalities in Thailand: geographic distribution of medical supplies in the provinces	wrong population

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114	Nomura, K.	2009	The shortage of pediatrician workforce in rural areas of Japan	wrong population
115	Nyamtema, A. S.	2011	Tanzanian lessons in using non-physician clinicians to scale up comprehensive emergency obstetric care in remote and rural areas	wrong population
116	Ohta, R.	2020	Rural homecare nurses challenges in providing seamless patient care in rural Japan	wrong population
117	Okoroafor, S. C.	2021	Estimating frontline health workforce for primary healthcare service delivery in Bauchi State, Nigeria	wrong population
118	Olsen, O. E.	2005	Human resources for emergency obstetric care in northern Tanzania: distribution of quantity or quality?	wrong population
119	Oosterbroek, T.A.	2017	Rural nursing preceptorship: an integrative review	wrong publication type
120	Palumbo, M.V.	2009	Retaining an aging nurse workforce: perceptions of human resource practice	Not medical desert
121	Pathman, D. E.	2005	Changes in age-adjusted mortality rates and disparities for rural physician shortage areas staffed by the National Health Service Corps: 1984-1998	not HWF
122	Petrovcic, R.	2016	Defining rural, remote and isolated practices: the example of Slovenia	wrong publication type
123	Phillips, R. L.	2007	The Canadian contribution to the US physician workforce	Not medical desert
124	Pierce, D.	2016	Mental health academics in rural and remote Australia	wrong publication type
125	Pitblado, R.	2012	Geographical distribution of rural health human resources	wrong publication type
126	Preston, B.	2009	The Australian nurse and midwifery workforce: issues, developments and the future	wrong publication type
127	Rafiq, A.	2005	Telemedicine for access to quality care on medical practice and continuing medical education in a global arena	wrong publication type
128	Rao, K. D.	2012	So many, yet few: Human resources for health in India	wrong population
129	Rao, K. D.	2016	Composition and distribution of the health workforce in India: estimates based on data from the National Sample Survey	wrong population
130	Rao, M.	2011	Human resources for health in India	wrong population
131	Roth, K.	2017	Legal structures of emergency medical services. The research project EMSiG "Preclinical Emergency Medical Services in Germany"	wrong publication type
132	Rubin, G.	1983	Primary health care workers: the rural health aide program in El Salvador	wrong population
133	Rutebemberwa, E.	2014	Financial interventions and movement restrictions for managing the movement of health workers between public and private organizations in low- and middle-income countries	wrong population
134	Salgado-de Snyder, N.	2003	A model for integrating mental healthcare resources in the rural population of Mexico	wrong population
135	Sato, M.	2017	Measuring three aspects of motivation among health workers at primary level health facilities in rural Tanzania	wrong population
136	Sawaengdee, K.	2017	Factors associated with the choice of public health service among nursing students in Thailand	wrong population

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137	Scheil-Adlung, X.	2015	Health sector employment: a tracer indicator for universal health coverage in national social protection floors	wrong population
138	Schubert, N.	2018	International approaches to rural generalist medicine: a scoping review	wrong publication type
139	Shah, S. M.	2016	Motivation and Retention of Physicians in Primary Healthcare Facilities: A Qualitative Study From Abbottabad, Pakistan	wrong population
140	Shaikh, B. T.	2013	Political and economic unfairness in health system of Pakistan: a hope with the recent reforms	wrong population
141	Shen, C.	2020	Measuring spatial accessibility and within-province disparities in accessibility to county hospitals in Shaanxi Province of Western China based on web mapping navigation data	wrong population
142	Shivam, S.	2014	Nursing personnel planning for rural hospitals in Burdwan District, West Bengal, India, using workload indicators of staffing needs	wrong population
143	Singh, A.	2019	Shortage and inequalities in the distribution of specialists across community health centres in Uttar Pradesh, 2002-2012	wrong population
144	Sirili, N. K.	2019	"Doctors ready to be posted are jobless on the street" the deployment process and shortage of doctors in Tanzania	wrong population
145	Skapetis, T.	2018	Patient satisfaction and an international graduate workforce programme	Not medical desert
146	Skillman, S.M.	2006	Characteristics of registered nurses in rural versus urban areas: implications for strategies to alleviate nursing shortages in the United States	wrong publication type
147	Smith, J.D.	2008	Defining remote medical practice	wrong publication type
148	Smith, M. W.	1978	The distribution of medical care in central California: A social and economic analysis	not HWF
149	Smith, R.	2014	Will There Be a Good General Surgeon When You Need One? (Part II) Solutions and Taking Back General Surgery	Not medical desert
150	Snyder, J. E.	2017	Defining Rurality in Medicare Administrative Data	wrong publication type
151	Song, P.	2016	Inequality of Paediatric Workforce Distribution in China	wrong population
152	Sousa, A.	2012	Monitoring inequalities in the health workforce: The case study of Brazil 1991-2005	wrong population
153	Strasser, R.	2016	Rural health care access and policy in developing countries	wrong population
154	Tabari-Khomeiran, R.	2019	Inequity in the distribution of rural family physicians in Iran: a cross sectional study	wrong population
155	Tangcharoensathien, V.	2013	Health workforce contributions to health system development: A platform for universal health coverage	wrong population
156	Tanihara, S.	2011	Urbanization and physician maldistribution: a longitudinal study in Japan	wrong population
157	Tao, Y.	2014	Methods for measuring horizontal equity in health resource allocation: a comparative study	wrong population
158	Taylor, B.	2018	Who are community health workers and what do they do? Development of an empirically derived reporting taxonomy	wrong population

Number	1st author	year	title	Reason for exclusion
159	Taylor, C. E.	1992	Surveillance for equity in primary health care: policy implications from international experience	wrong population
160	Taylor, J. M.	1978	Keeping up with...planning rural health care: some examples from Maine	wrong publication type
161	Tseng, M. H.	2021	Accessibility assessment of community care resources using maximum-equity optimization of supply capacity allocation	wrong population
162	Vasan, A.	2017	Support and performance improvement for primary health care workers in low- and middle-income countries: a scoping review of intervention design and methods	not HWF
163	Vindigni, S. M. N.	2014	Kenya's emergency-hire nursing programme: a pilot evaluation of health service delivery in two districts	wrong population
164	Vujcic, M.	2012	An analysis of GAVI, the Global Fund and World Bank support for human resources for health in developing countries	wrong population
165	Wang, S.	2018	Trends in health resource disparities in primary health care institutions in Liaoning Province in Northeast China	wrong population
166	Wang, X.	2018	Spatial accessibility of primary health care in China: A case study in Sichuan Province	wrong population
167	Wang, Y.	2020	The disequilibrium in the distribution of the primary health workforce among eight economic regions and between rural and urban areas in China	wrong population
168	Wei, L.	2017	Tracking rural health service quality and evaluation mechanism: a bibliometric analysis	foreign language
169	Williams, E. N.	2014	Building capacity in the rural physiotherapy workforce: a paediatric training partnership	wrong publication type
170	Wiseman, V.	2017	Measuring inequalities in the distribution of the Fiji Health Workforce	wrong population
171	Wong, H. T.	2016	Spatial illustration of health-care workforce accessibility index in China: How far has our 2009 health-care reform brought us?	wrong population
172	Wu, H. C.	2018	Evaluating disparities in elderly community care resources: Using a geographic accessibility and inequality index	wrong population
173	Xu, K.	2014	Trend in distribution of primary health care professionals in Jiangsu province of eastern China	wrong population
174	Yang, L.	2019	What about the health workforce distribution in rural China? An assessment based on eight-year data	wrong population
175	Yang, L.	2019	Is the health workforce distribution in Beijing, China perfectly equitable?	wrong population
176	Zeng, W.	2018	The health resource allocation and equity of pediatric care in Sichuan province: a cross-sectional study	wrong population
177	Zhang, D.	2020	Assessment of changes in rural and urban primary care workforce in the united states from 2009 to 2017	wrong publication type
178	Zhou, K.	2015	Inequality trends of health workforce in different stages of medical system reform (1985-2011) in China	wrong population

Number	1st author	year	title	Reason for exclusion
179	Zhu, A.	2019	Analysis of strategies to attract and retain rural health workers in Cambodia, China, and Vietnam and context influencing their outcomes	wrong population
180	Zhu, B.	2018	Detecting the priority areas for health workforce allocation with LISA functions: an empirical analysis for China	wrong population
181	Zubieta, L.	2010	Factors of primary care demand: a case study	wrong publication type

- 1 Al Saffer Q, Al-Ghaith T, Alshehri A, Al-Mohammed R, Al Homidi S, Hamze MM, Herbst CH, Alazemi N. The capacity of primary health care facilities in Saudi Arabia: infrastructure, services, drug availability, and human resources. *BMC Health Serv Res.* 2021;21(1):365.
- 2 Alameddine M, Khodr H, Mourad Y, Yassoub R, Ramia JA. Upscaling the recruitment and retention of human resources for health at primary healthcare centres in Lebanon: a qualitative study. *Health Soc Care Community.* 2016;24(3):353-362.
- 3 Alvi R. Experience of developing rural surgical care in a remote mountainous region of Pakistan: Challenges and opportunities. *Annals of Tropical Medicine and public health.* 2011;4(1):57.
- 4 Ament LA. The integration of a QA/RM program in a rural healthcare obstetrical service. *J Qual Assur.* 1991;16(6):20-22.
- 5 Averill JB. Getting started: initiating critical ethnography and community-based action research in a program of rural health studies. *Int J Qual Methods.* 2006;5(2):17-27.
- 6 Ayaz A, Bahadur S. Brain drain human resources and human capital growth in Pakistan: a political and economical perspective. *Pak J Public Health.* 2014;4(1)
- 7 Badanta-Romero B, Moreno-Moreno B, Soto-Diaz V, Barrientos-Trigo S. Cuidados enfermeros para el abordaje de la salud comunitaria en población indígena de la Amazonia peruana. *Enfermería Clínica* 2021;31(1):57-63.
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- 10 Bärnighausen T, Bloom DE. Financial incentives for return of service in underserved areas: A systematic review. *BMC Health Serv Res.* 2009;9:86.
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- 12 Batura N, Skordis-Worrall J, Thapa R, Basnyat R, Morrison J. Is the Job Satisfaction Survey a good tool to measure job satisfaction amongst health workers in Nepal? Results of a validation analysis. *BMC Health Serv Res.* 2016;16:308.
- 13 Benskin, LLL. A Concept Development of the Village Health Worker. *Nurs Forum.* 2012;47(3):173-182.
- 14 Berke EM, West AN, Wallace AE, Weeks WB. Practical and policy implications of using different rural-urban classification systems: A case study of inpatient service utilization among veteran administration users. *J Rural Health.* 2009;25(3):259-266.
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- 16 Bhan, N, McDougal L, Singh A, Atmavilas Y, Raj A. Access to women physicians and uptake of reproductive, maternal and child health services in India. *EClinicalMedicine*. 2020;5:20:100309.
- 17 Brahmapurkar KP, Zodpey SP, Sabde YD, Brahmapurkar VK. The need to focus on medical education in rural districts of India. *Natl Med J India*. 2018;31(3):164-168.
- 18 Breindel CL, Goldberg DM. Marketing strategies in rural areas. *J Ambul Care Manage*. 1981;4(4):15-29.
- 19 Brown MC. Using Gini-style indices to evaluate the spatial patterns of health practitioners: Theoretical considerations and an application based on Alberta data. *Soc Sci Med*. 1994;38(9):1243-1256.
- 20 Brown P. Place matters. *Aust J Rural Health*. 2016;24(1):67.
- 21 Bryant M, Essomba RO. Measuring time utilization in rural health centres. *Health Policy Plan* 1995;10(4):415-422.
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