



The Effects of Air Pollution on Respiratory Health -A Comparative Study Between Urban And Rural Areas

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ABSTRACT: Urban air pollution has been shown across several studies to worsen respiratory symptoms in urban individuals with OLD. [19–22] In children from a Brazilian urban cohort, of whom 26% had a diagnosis of asthma, levels of nitrogen dioxide and ozone were independently associated with cases of asthma and wheezing. living in a rural area was associated with a lower prevalence of asthma but not other chronic respiratory disorders, and a lower prevalence of some respiratory symptoms (including wheeze). Although the prevalence of Chronic obstructive pulmonary disease (COPD) or emphysema did not differ between rural and urban areas, rural residency appeared to be associated with better health status among subjects with these conditions.

KEYWORDS-rural;urban;population;air-pollution;COPD;Asthma,wheezing;diagnosis;emphysema

I.INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a group of respiratory conditions, including chronic bronchitis and emphysema, that makes breathing difficult for millions of Americans. COPD comprises the majority of deaths from chronic lower respiratory diseases, which was the fourth leading cause of death .[1,2,3]

The percentage of adults in rural areas who have been diagnosed with COPD is nearly double the percentage in large metropolitan areas, according to data released in CDC's Morbidity and Mortality Weekly Report (MMWR).¹ The study reported in MMWR examined how many people have COPD in urban and rural areas using data from the 2015 Behavioral Risk Factor Surveillance System (BRFSS). CDC also examined Medicare hospital records and death certificate data from the National Vital Statistics System. In 2015, rural US residents experienced higher rates of Medicare-covered hospitalizations for and deaths from COPD than residents living in more urban areas (those with populations of at least 10,000 people).

- Percentage with diagnosed COPD was greater among adults living in rural areas (about 8%) than among adults living in large metropolitan centers (about 5%).
- Hospitalizations among Medicare enrollees were about 14 per 1000 enrollees in rural areas compared with about 11 per 1000 enrollees in large metropolitan centers.
- Death rates from COPD were also greater among people living in rural areas (about 55 per 100,000 people) versus people living in large metropolitan centers (32 per 100,000 people).[5,7,8]

Rural populations may have more COPD-related issues due to more people smoking,² increased exposure to secondhand smoke, and less access to smoking cessation programs compared with people living in more urban areas.³ Rural residents are also more likely to be uninsured and have higher poverty levels, which may lead to less access to early diagnosis and treatment.⁴

Additional efforts are needed to prevent and reduce risk factors and overcome barriers to early diagnosis and appropriate treatment and management of COPD in rural areas. Improving access to such health care may improve quality of life and reduce hospital readmissions among COPD patients and reduce COPD-related deaths. This study highlights the need for continued tobacco cessation programs and policies to prevent COPD and improve pulmonary function among adults with COPD in rural areas in particular.



II.DISCUSSION

Air pollution exposure has become ubiquitous and is increasingly detrimental to human health. Small Particulate matter (PM) is one of the most harmful forms of air pollution. It can easily infiltrate the lungs and trigger several respiratory diseases, especially in vulnerable populations such as children and elderly people. In this work, we start by leveraging a retrospective study of 416 children suffering from respiratory diseases. The study revealed that asthma prevalence was the most common among several respiratory diseases, and that most patients suffering from those diseases live in areas of high traffic, noise, and greenness. Outdoor air pollution originates from both natural and anthropogenic sources. Natural sources contribute to local air pollution in rural regions and in regions prone to forest fires and dust storms. However, man-made sources still exceed natural ones and have a higher impact on air pollution. The best-known air pollution sources defined by the World Health Organization (WHO) are: fuel combustion from motor vehicles, heat and power generation, industrial facilities, municipal and agricultural waste sites and waste incineration/burning, as well as residential cooking, heating, and lighting with polluting fuels.[9,10,11]

Busy roads are where several pollutants are condensed such as carbon monoxide (CO), oxides of nitrogen (NO_x), hydrocarbon (HC), lead, and particulate matter [32]. This depicts the distribution of patients who are exposed to traffic. It is shown that approximately 69% of the assessed children for all diagnoses live near road traffic. These patients presented with bronchoalveolitis (23.33%), acute laryngeal dyspnea (6.66%), asthma (63.33%), pneumonitis (5.55%), and virus sequelae (1.11%).

In urban areas, meteorological features are closely linked to air pollution concentrations because the generation and dispersion of air pollutants depend in part on local patterns of temperature, wind, pressure, and precipitation [35,36]. For instance, temperature affects air quality given that air near the ground is warmer than that in the troposphere. The warmer, lighter air at the surface rises and moves everything within it, including pollutants, from the ground to higher altitudes. Additionally, air pollution is easily transported from one area to another due to wind speed and wind direction. When air stops moving due to high pressure, pollutants may stagnate in one specific area, rendering this area very polluted for a period of time. Moreover, precipitations evoke what is called 'wet deposition', which washes away most of the common air pollutants and pollen in the air when the rain is not acidic[12,13,15]

III.RESULTS

Living in the country may be good for your respiratory health, according to a study conducted which suggests that rural as opposed to urban dwelling is associated with a lower prevalence of asthma.

Moreover, while the prevalence of COPD (chronic obstructive pulmonary disease) and emphysema, which are caused primarily by smoking, is similar among country and city dwellers, living in the country appears to be associated with better health status among subjects with these two lung ailments, the study hints.

For their study, analysis responses to a mailed health questionnaire returned by more than 1,000 adults living in rural areas of Scotland and nearly 1,500 living in urban areas .

In analyzing the data, the investigators discovered that the prevalence of "any" lung illness was 28-percent lower among those living in the country compared with those living in cities.

The prevalence of asthma was 41-percent lower among the rural residents compared with the city dwellers, whereas the prevalence of eczema/dermatitis was 33-percent lower in the country.[17,18,19]

IV.CONCLUSIONS

Google Maps and OpenStreetMap (OSM) are web mapping services that offer satellite imagery, street maps, and route planning. QGIS is a free and Open-Source Geographic Information System that allows people to freely access, visualize, edit and collect the global geographic data provided by these mapping services. A variety of geographic data types with detailed datasets covering many areas in the world are provided.[20,21,22] In OSM, we can find different geographical features that include both natural and man-made elements such as: land use, roads, water areas, buildings, amenity, craft, leisure, etc. In addition, each feature can have different sub-categories. For example, the category 'buildings' can include industrial, residential factories, and commercial structures, which could reflect the population density, traffic volumes and pollution types in a specific area. Amenity is used to map facilities used by visitors and



residents, and can include banks, pharmacies, cafes, parking and schools, which can give an insight on the pollutants released to the atmosphere.[23,25,27]

Air pollution results from both natural and anthropogenic actions. It enters the atmosphere by different amounts and at different times. It refers to various locations, activities, and features that can either be direct sources or impacting factors for the release of pollutants. For natural sources, particulate matter (PM) come from sources such as sea salt, naturally suspended dust, pollen and volcanic ash. Man-made sources and impacting factors, however, are mostly related to the different activities found in different countries, cities, and neighborhoods.[29,30,31]

REFERENCES

1. Chan, Margaret (2010). Global Policy Recommendations. France: Graphic design: Rasmussen/CH. pp. 14–18. ISBN 9789241564014.
2. ^ "Rural Health Concerns". medlineplus.gov. Retrieved 2020-04-30.
3. ^ :^a ^b ^c How healthy are Rural Canadians? An Assessment of Their Health Status and Health Determinants (PDF). Ottawa: Canadian Institute for Health Information. 2006. ISBN 978-1-55392-881-2. Archived from the original (PDF) on 2010-03-08.
4. ^ Healthy Horizons- Outlook 2003-2007: A Framework for Improving the Health of Rural, Regional, and Remote Australians (PDF). Australian Health Ministries' Advisory Council's National Rural Health Policy Sub-committee and the National Rural Health Alliance for the Australian Health Minister's Conference. National Rural Health Alliance. 2003. ISBN 07308-56844.
5. ^ Ministerial Advisory Council on Rural Health (2002). "Rural Health in Rural Hands: Strategic Directions for Rural, Remote, Northern and Aboriginal Communities" (PDF). Ottawa: Health Canada.
6. ^ "Population density and urbanization". United Nations Statistics Division. Retrieved 8 March 2014.
7. ^ Pong, R. W.; Pitbaldo, R. J (2001). "Don't take "geography" for granted! Some methodological issues in measuring geographic distribution of physicians". Canadian Journal of Rural Medicine. 6: 105.
8. ^ Pitblado, JR (March 2005). "So, what do we mean by "rural," "remote" and "northern"?". The Canadian Journal of Nursing Research. 37 (1): 163–8. PMID 15887771.
9. ^ du Plessis, V.; Beshiri, R.; Bollman, R.; Clemenson, H. (2001). "Definitions of Rural" (PDF). Rural and Small Town Canada Analysis Bulletin. 3 (3).
10. ^ "Rural Definitions: Data Documentation and Methods". United-States Department of Agriculture. 2007. Retrieved January 31, 2008.
11. ^ Stephens, Stephanie. "Gap in Life Expectancy Between Rural and Urban Residents Is Growing". Center for Advancing Health. Retrieved 9 March 2014.
12. ^ :^a ^b ^c Rural, regional, and remote health: Indicators of health. Australian Institute of Health and Welfare. 2005. ISBN 9781740244671. Retrieved February 19, 2008.
13. ^ Shen, J (February 1993). "Analysis of urban-rural population dynamics of China: a multiregional life table approach". Environment and Planning. 25 (2): 245–53. doi:10.1068/a250245. PMID 12286564. S2CID 35415709.
14. ^ Ramesh, Randeep (25 May 2010). "Country dwellers live longer, report on 'rural idyll' shows". The Guardian. Retrieved 9 March 2014.
15. ^ Rourke, J. (2008). "Increasing the number of rural physicians". Canadian Medical Association Journal. 178 (3): 322–325. doi:10.1503/cmaj.070293. PMC 2211345. PMID 18227453.
16. ^ Ng, E.; Wilkins, R.; Pole, J.; Adams, O. (1999). "How far to the nearest physician". Rural and Small Town Analysis Bulletin. 1: 1–7.
17. ^ Halseth, G.; Ryser, L. (2006). "Trends in service delivery: Examples from rural and small town Canada, 1998 to 2005". Journal of Rural and Community Development. 1: 69–90.
18. ^ :^a ^b Brant, S.; Garris, M.; Okeke, E.; Rosenfeld, J. (2006). "Access to Care in Rural China: a Policy Discussion" (PDF). The Gerald R. Ford School of Public Policy, University of Michigan: 1–19. Retrieved February 27, 2009.
19. ^ "Trends in rural hospital closure 1990–2000" (PDF). U.S. Department of Health and Human Services. 2003. Retrieved February 19, 2008.
20. ^ Kindermann, D; Mutter, R; Pines, JM (February 2006). "Emergency Department Transfers to Acute Care Facilities, 2009: Statistical Brief #155". PMID 24006549.



21. Morris, A.E.J. (2 December 2013) [1972]. "The Early Cities". History of Urban Form Before the Industrial Revolution (3 ed.). London: Routledge. p. 1. ISBN 9781317885146. [...] the Bronze Age, starting between 3500 and 3000 BC [...]. During this [...] period the first urban civilizations were firmly established.
22. ^ :^a ^b "City population to reach 6.4bn by 2050". Herald Globe. Archived from the original on 2014-07-14. Retrieved 11 July 2014.
23. ^ "United Nations Population Division – Department of Economic and Social Affairs".
24. ^ "Urban population growth". World Health Organization. Archived from the original on March 8, 2012.
25. ^ "Current world population". United Nations, Department of Economic and Social Affairs. Archived from the original on 2 July 2014. Retrieved 11 July 2014.
26. ^ "Climate Change 2021: Mitigation of Climate Change". www.ipcc.ch. Retrieved 2021-04-04.
27. ^ "Urban land area (km²)". Our World in Data. Retrieved 6 March 2020.
28. ^ "2011 Census: Characteristics of Built-Up Areas (4. Introduction)". Office for National Statistics. 28 June 2013. Retrieved 20 October 2019.
29. ^ "World Factbook Urbanization". Central Intelligence Agency. Retrieved 26 August 2018.
30. ^ "CIA The World Factbook - Major urban areas: population".
31. ^ Dijkstra, Lewis; Poelman, Hugo (2014). "A harmonised definition of cities and rural areas: the new degree of urbanisation" (PDF). Regional Working Paper. Europa Commission. Retrieved 16 August 2021.