

# Geographical Overlapping of Obesity, Heart Disease, and Type 2 Diabetes

*[Announcer] This program is presented by the Centers for Disease Control and Prevention.*

[Latoya Simmons] Welcome to this edition of *PCD Sound Bites*. I'm your host, Latoya Simmons. The global prevalence of obesity is a major threat to public health due to its large increase in recent years. With more than 30 percent of adults in the world classified as obese or overweight, according to their body mass index, this trend, which can lead to various chronic diseases, is one of international concern. Today, we are speaking with one of the winners of *PCD's* 2017 Student Research Paper Contest, Kayla Smurthwaite, an undergraduate student at Australian National University in Canberra, Australia. Her winning research focuses on the geographic variation in obesity, heart disease, and type 2 diabetes in west Adelaide, Australia. In this interview, we'll discuss the results of Ms. Smurthwaite's study and what impact her research has on chronic disease prevention and public health. Thank you for joining us today, Ms. Smurthwaite.

[Kayla Smurthwaite] Thanks for the opportunity to speak with you today. I'm very excited to be able to share my research.

[Latoya Simmons] Your study examined the prevalence of obesity, cardiovascular disease, and type 2 diabetes in West Adelaide, Australia. What was the rationale for conducting your study in this particular area of Australia?

[Kayla Smurthwaite] So, West Adelaide, or otherwise known as Adelaide City, is one of Australia's capital cities, and we chose to investigate the region because it is socioeconomically diverse over a relatively small geographical area. But also the general practices that we recruited were particularly interested in the prevention of chronic disease and wanted to know how they could improve their data recording and prevention strategies.

[Latoya Simmons] Determining the geographical variation of obesity, heart disease, and type 2 diabetes using clinical data is very interesting and appropriate. Can you tell us how and why this approach was adopted for your study?

[Kayla Smurthwaite] So for our study we recruited 16 general practices across West Adelaide, and we used a deidentified version of their clinical records to examine the average BMI, the percentage of people with heart disease, and the percentage of people with type 2 diabetes at the small area level. For our study we used statistical area level one, which is equivalent to a suburb or a population of about 400 people. And we used this approach to identify which communities in our study region had the highest and lowest rates of obesity, heart disease, and type 2 diabetes, because we wanted to understand which populations are most in need of community level interventions.

[Latoya Simmons] Findings from your study report the use of thematic maps. Tell listeners what this is, why this type of analysis was chosen, and what it revealed?

[Kayla Smurthwaite] So geographical variation is best displayed using these thematic maps, and in total we had six maps, three of which showed variation of mean BMI, heart disease, and type 2 diabetes diagnosis across West Adelaide, and three of which showed significant high and low rates of the conditions. And we examined these spacial clusters of high or low obesity, heart disease, and type 2 diabetes using the Getus, or GI, technique, which, if we use heart disease as an example, this tool compares the value of heart disease for one small area level to the total sum of heart disease for the study area. And areas with significant positive dead scores signify a hotspot, or a high-rate cluster of the disease, and areas that have a significant negative dead score show cold spots of disease. And through our study we revealed that there was geographical convergence, or overlapping, of hotspots for obesity, heart disease, and type 2 diabetes in the northern industrial areas and the eastern city regions of West Adelaide, which are known to be low socioeconomic areas. But we also saw convergence of cold spots in the southwest coastline of West Adelaide, which is a suburban area with notably high socioeconomic status.

[Latoya Simmons] What implications does your study have for public health in Australia?

[Kayla Smurthwaite] So through combining geosocial analysis and general practice data, we can share with health care professionals and policy makers the patterns of chronic disease. And this allows us to inform the general practices in the study region which communities require increase surveillance. So directly, our study enables these health care professionals to target the right people in the right location, but also the study may have some implications for resource allocation by government funding.

[Latoya Simmons] How can a similar approach to identify geographic variation of obesity, heart disease, and type 2 diabetes be used by other researcher globally?

[Kayla Smurthwaite] So this was actually a large part of our study, and we wanted to show other researchers how clusters of disease could be determined and visualized. And the approach is not limited to obesity, heart disease, and type 2 diabetes. It can be applied to any chronic or infectious disease. But further, the message works for all formats of medical records, including hospital admissions or even insurance claims, as long as there's detail on the geographical location of the patients and a substantial sample size a researcher could follow the methods we used in our study step-by-step.

[Latoya Simmons] Thank you for joining us, Ms. Smurthwaite. You can read her study online at [cdc.gov/pcd](https://www.cdc.gov/pcd).

*The findings and conclusions in this report are those of the author and do not necessarily represent the official views of the Centers for Disease Control and Prevention.*

[Announcer] For the most accurate health information, visit [cdc.gov](https://www.cdc.gov) or call 1-800-CDC-INFO.