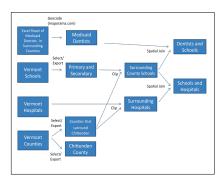# USING GIS TO ANALYZE MOBILE DENTAL CARE NEED IN VERMONT

Health and Biological Sciences
Sarah Gallalee, Class of 2013
Beverley Wemple, Department of Geography
College of Arts and Sciences

Figure 3: The Mobile Dental Care Van

METHODS

Figure 1: Conceptual diagram of the methods used in GIS to determine the closest dentist accepting Medicaid and hospital to each primary and secondary school in the five counties surrounding Chittenden County.
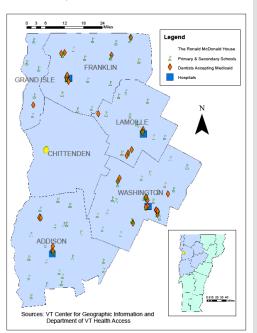
IMPLICATIONS

• From 2010-2011 the Ronald McDonald House mobile dental care van provided care to approximately 270 children, 75% of whom had Medicaid insurance[1]. According to a representative from the VT Department of Health, 80% of care for Medicaid patients in VT is done in private offices[2]. This indicates that understanding where dentists accepting Medicaid are located and where they are absent is useful in determining where the mobile clinic is needed.

• Geographic Information Systems (GIS) is a computer program that can be used to capture, store, analyze, and exhibit spatial data. By using this program to calculate the distances between each school and the closest dentist accepting Medicaid it was possible to determine which schools have the most need for the mobile dental care van.

• This research is important because families without means in rural counties often face large geographic barriers in reaching dental care such as a lack of services and transportation. Mobile dental clinics are a potential approach to providing care to rural communities that lack access. As the Ronald McDonald House did not have the technology of GIS beforehand, this service learning project provided the organization with a useful tool in analyzing future plans for the mobile clinic.

RESULTS

Vermont Primary or Secondary School Name	Distance to a Dentist Accepting Medicaid(mi)	Distance to Hospital (mi)
Hancock Village School	16.89	23.61
Orwell Village School	15.64	23.01
Granville Village School	15.24	22.83
Fayston Elementary School	11.54	18.85
Belvidere Central School	11.27	17.38
Woodbury Elementary School	11.24	17.17
Isle La Motte Elem. School	11.22	17.05
Shoreham Elementary School	11.10	16.43
Cabot School	10.63	16.37
Whiting Village School	10.45	16.35
Robinson School	10.18	16.28
Leicester Central School	10.10	16.20

Table 1: The schools more than ten miles to a dentist that accepts Medicaid, along with their distances to the closest hospital.

Figure 2: Spatial portrayal of dentists who accept Medicaid, hospitals, and primary/secondary schools in the counties surrounding Chittenden County (2011). Distances to schools and hospitals were used because the mobile dental care van provides care at schools and must partner with a hospital to do so.

Project Description

The purpose of this research was to use Geographic Information Systems to determine the areas of highest need for the Ronald McDonald House of Burlington's mobile dental care van. It was determined that there are twelve schools more than ten miles from the nearest dentist accepting Medicaid, and these schools are more than sixteen miles from the nearest hospital.

In rural areas there are fewer dentists per population than in urban areas which leads to lower dental care utilization, morel decay, and more tooth loss[3]. Identifying the areas of greatest need was crucial to the Ronald McDonald House in providing care to neglected populations.

This work is innovative because it explores the cutting-edge field of medical geography and seeks to solve health issues by integrating geography and public health. GIS is an essential tool in public health because it can overlay multiple variables, calculate distances, and analyze areas of need.

Acknowledgments

President E. Thomas Sullivan
Presidential Installation Ceremony
Student Scholars Poster Competition
University of Vermont, October 2012

ENDNOTES
1. Fenimore, P. (2011). Ronald McDonald Care Mobile. In R. M. H. Charities (Ed.) Burlington, VT: The Offset House.
2. Miller, R. Personal Communication, November 22nd, 2011
3. Skillman, S. M., Doescher, M. P., Mouradian, W. E., & Brunson, D. K. (2010). The challenge to delivering oral health services in rural America. Journal of Public Health Dentistry, 70, S49-S57.