Density of High-Speed Broadband Connections by Census Tract Level Persistent Poverty Status

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1. Background
Digital tools and resources (e.g., patient portals, online support groups) have the potential to expand access to clinical care and supportive services for people with cancer; however, access to these tools and resources is limited among individuals with low levels of digital inclusion. One of the key elements of digital inclusion is access, or the availability of high-speed, reliable internet and related equipment. Persistent poverty areas, or those where at least 20 percent of the population has reported incomes below the federal poverty level for 30+ years, experience sustained social and economic disinvestment and may represent areas with low levels of access to highspeed broadband, limiting residents' ability to fully engage with digital resources to support their receipt of high-quality cancer care.

2. Goals
The purpose of this study is to describe density of high-speed broadband connections in the catchment area of the Karmanos Cancer Institute (KCI) in Michigan, and to compare by census tract level poverty designation, comparing persistent poverty (PP) vs. non-persistent poverty (non-PP) tracts.

3. Solutions and Methods
Broadband connection density data are from the Federal Communications Commission maps of fixed connections by census tract and included in the National Neighborhood Data Archive (NaNDA) Internet Access by Census Tract file for the United States (2015-2019). High speed connections are those with an average download or upload speed of at least 200 kilobits per second (kbps) and were analyzed categorically (<400, 400-599, 600-799, 800+ connections per 1000 households). Census tract persistent poverty designations were obtained from the National Cancer Institute Geographically Underserved Areas website.

4. Outcomes
Overall, the KCI catchment area includes 46 counties and 2,009 census tracts with data on broadband availability. Of those census tracts, 292 (14.5%) experienced persistent poverty. Throughout the KCI catchment area, a plurality (39%) of census tracts had the highest density of high-speed connections (800+ per 1000 households), followed by 600-799 (30%), 400-599 (18%), and <400 connections per 1000 households (14%). Density of high-speed connections varied significantly (p<0.001) by poverty status. In non-PP tracts, 45 percent were in the highest category of high-speed connection density (800+ per 1000), compared with only 2 percent of PP tracts. High speed connection density of 600-799 per 1000 households was also higher in non-PP than PP tracts (33% vs. 12%); however, the lowest broadband densities were most common in PP vs. non-PP tracts (49% in PP tracts vs. 12% in non-PP tracts for 400-599 connections per 1000 households; 37% vs. 10% for the lowest density of <400 connections per 1000 households).

5. Lessons Learned and Future Directions
Digital tools have the potential to expand access to clinical and supportive care services for people with cancer; however, structural factors may limit the ability of many, particularly those living in under-resourced settings, to fully access and benefit from them. Cancer centers must consider their potential

role in supporting patients, particularly those with low levels of digital inclusion, in accessing and fully benefitting from available digital resources.