

## INTISARI

Peningkatan populasi penduduk di Kota Yogyakarta berbanding lurus dengan peningkatan kebutuhan fasilitas layanan, termasuk fasilitas pelayanan kesehatan. Meskipun perhitungan *Provider to Population Ratio* (PPR) menunjukkan bahwa aksesibilitas fasilitas pelayanan kesehatan sudah ideal dan merata, perhitungan ini hanya berdasarkan aspek nonspasial dengan asumsi populasi dan fasilitas tersebar merata di suatu area, sehingga kurang menggambarkan keadaan sebenarnya. Integrasi data spasial dan nonspasial diperlukan untuk mendapatkan informasi yang lebih representatif. Saat ini, belum tersedia informasi terkait aksesibilitas fasilitas pelayanan kesehatan di Kota Yogyakarta dan sekitarnya dengan mempertimbangkan aspek spasial.

Aksesibilitas fasilitas pelayanan kesehatan dipetakan melalui analisis area layanan dengan mengintegrasikan data spasial beserta atribut pendukung, seperti data jaringan jalan dan lokasi fasilitas pelayanan kesehatan dari *OpenStreetMap* (OSM), data persebaran populasi penduduk (*InariskPop*) dari Inarisk BNPB, serta data batas administrasi dari Ina-Geoportal dan Geoportal daerah. Analisis area layanan dilakukan menggunakan pgRouting dan QGIS, dengan menghitung waktu tempuh dari 15 titik fasilitas pelayanan kesehatan. Kondisi jaringan jalan, seperti jarak, kecepatan berkendara, pemberlakuan larangan belok, dan arah diperhitungkan sebagai pembatasan dalam analisis jaringan yang dapat mempengaruhi waktu tempuh. Area layanan dibentuk dari fasilitas pelayanan kesehatan menuju seluruh area Kota Yogyakarta dan sekitarnya hingga batas Jalan Ring Road, menggunakan kecepatan maksimum berkendara pada setiap kelas jalan. Interval waktu tempuh yang digunakan adalah 0-8 menit dan lebih dari 8 menit, sesuai standar internasional *National Fire Protection Association* (NFPA) yang menetapkan 8 menit sebagai waktu respon maksimal untuk *Advanced Life Support* (ALS), termasuk layanan medis darurat. Jika melebihi batas waktu tersebut, maka suatu lokasi dianggap tidak mendapatkan akses pelayanan medis darurat yang baik.

Hasil kegiatan proyek akhir ditampilkan dalam bentuk peta *isochrone* yang menunjukkan area layanan dari fasilitas pelayanan kesehatan. Analisis zonasi menggunakan *tools Raster Layer Zonal Statistics* menghasilkan luas area dan jumlah populasi penduduk pada setiap area layanan. Analisis zonasi menunjukkan sebagian besar area Kota Yogyakarta dan sekitarnya hingga batas Jalan Ring Road dapat dijangkau oleh layanan medis darurat (ambulans) dalam waktu tempuh 8 menit. Pada rentang waktu tempuh 0-8 menit, RS Panti Rapih memiliki area layanan terluas, yaitu 82.909,800 km<sup>2</sup>, sementara RS Dr. R. Soetarto melayani penduduk terbanyak, yaitu 713.229 jiwa. Analisis zonasi area layanan keseluruhan dari 15 fasilitas juga menunjukkan bahwa seluruh area dapat dijangkau oleh layanan medis darurat (ambulans) dalam waktu tempuh 8 menit, dengan total area 85.554,000 km<sup>2</sup> dan 729.924 jiwa penduduk yang terlayani. Dengan demikian, dapat disimpulkan bahwa seluruh area Kota Yogyakarta dan sekitarnya hingga batas Jalan Ring Road mendapatkan akses pelayanan medis darurat yang baik dari 15 fasilitas pelayanan kesehatan yang berada di wilayah tersebut.

**Kata kunci:** aksesibilitas, fasilitas pelayanan kesehatan, waktu tempuh, area layanan, analisis jaringan

## ABSTRACT

*The increase population in Yogyakarta City is directly proportional to the increase in demand for service facilities, including health care facilities. Although the Provider to Population Ratio (PPR) calculation shows that the accessibility of health service facilities is ideal and evenly distributed, this calculation is only based on nonspatial aspects with the assumption that the population and facilities are evenly distributed in an area, so it does not describe the actual situation. Integration of spatial and non-spatial data is required to obtain more representative information. Currently, there is no information available regarding the accessibility of health service facilities in Yogyakarta City and surrounding areas by considering spatial aspects.*

*The accessibility of health care facilities was mapped through service area analysis by integrating spatial data and supporting attributes, such as road network data and the location of health care facilities from OpenStreetMap (OSM), population distribution data (InariskPop) from Inarisk BNPB, and administrative boundary data from Ina-Geoportal and regional Geoportal. Service area analysis was conducted using pgRouting and QGIS, by calculating travel time from 15 points of health service facilities. Road network conditions, such as distance, driving speed, turn restrictions, and direction were taken into account as restrictions in the network analysis that could affect travel time. The service area was formed from the health care facilities to the entire area of Yogyakarta City and surrounding areas up to the Ring Road boundary, using the maximum driving speed on each road class. The travel time intervals used were 0-8 minutes and more than 8 minutes, in accordance with the National Fire Protection Association (NFPA) international standard that sets 8 minutes as the maximum response time for Advanced Life Support (ALS), including emergency medical services. If it exceeds this time limit, then a location is considered not to have good access to emergency medical services.*

*The results of the final project are displayed in the form of an isochrone map that shows the service area from the health service facilities. The zoning analysis using the Raster Layer Zonal Statistics tool produces the area and total population of each service area. The zoning analysis shows that most areas of Yogyakarta City and surrounding areas up to the Ring Road boundary can be reached by emergency medical services (ambulance) within 8 minutes from each facility point. In the 0-8 minute travel time range, Panti Rapih Hospital has the largest service area, at 82.909,800 km<sup>2</sup>, while Dr. R. Soetarto Hospital serves the largest population, at 713.229 people. The overall service area zoning analysis of the 15 facilities also shows that the entire area can be reached by emergency medical services (ambulance) within 8 minutes, with a total area of 85.554,000 km<sup>2</sup> and 729.924 people served. Thus, it can be concluded that all areas of Yogyakarta City and surrounding areas up to the Ring Road boundary have good access to emergency medical services from 15 health service facilities located in the area.*

**Keywords:** *accessibility, health service facilities, travel time, service area, network analysis*