

Mapping Food Deserts and COVID Vulnerability

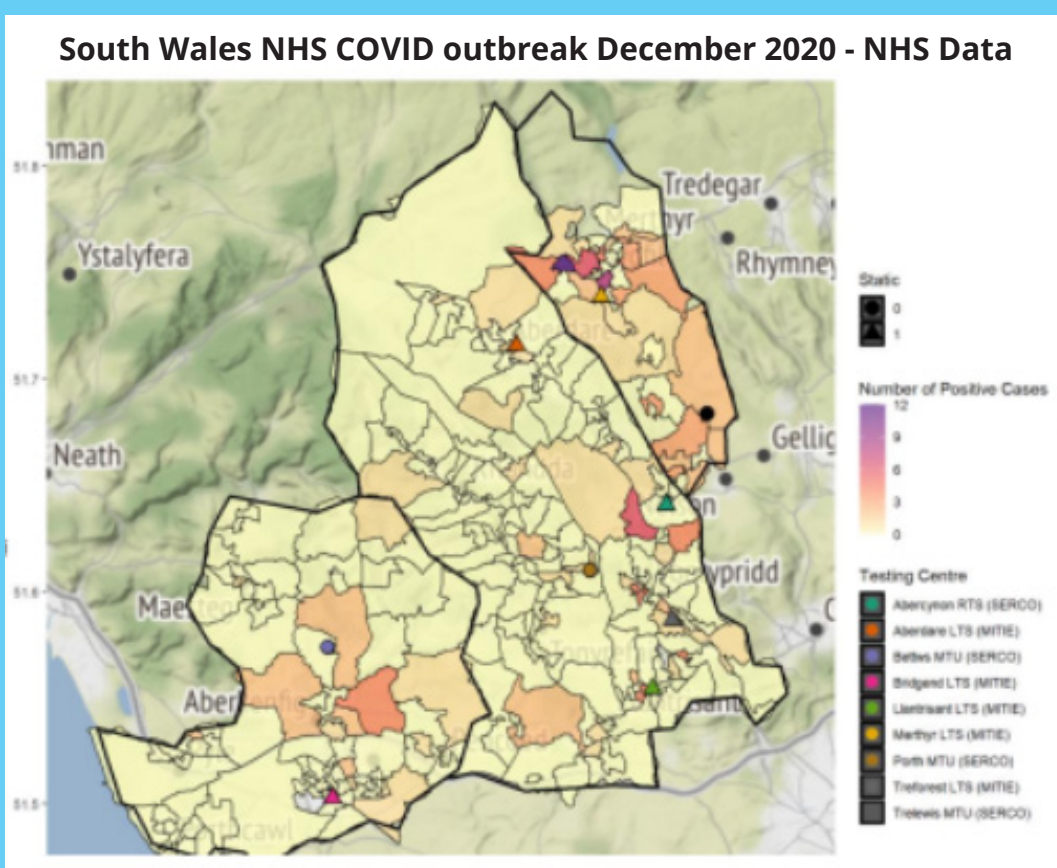
'A Community-Led Resilience Approach'

Pioneering humanitarian disaster-mapping techniques in community mapping COVID vulnerability for hyper- local insight into public-health risks

Preliminary research: Two tiers of COVID Vulnerability

Mental/Social Health:
Loneliness/Isolation/
Empowerment
Social/financial inclusion
= Vacc hesitancy

Clinical Health:
Exercise
Nutrition
Obesity/Overweight
Co-morbidities



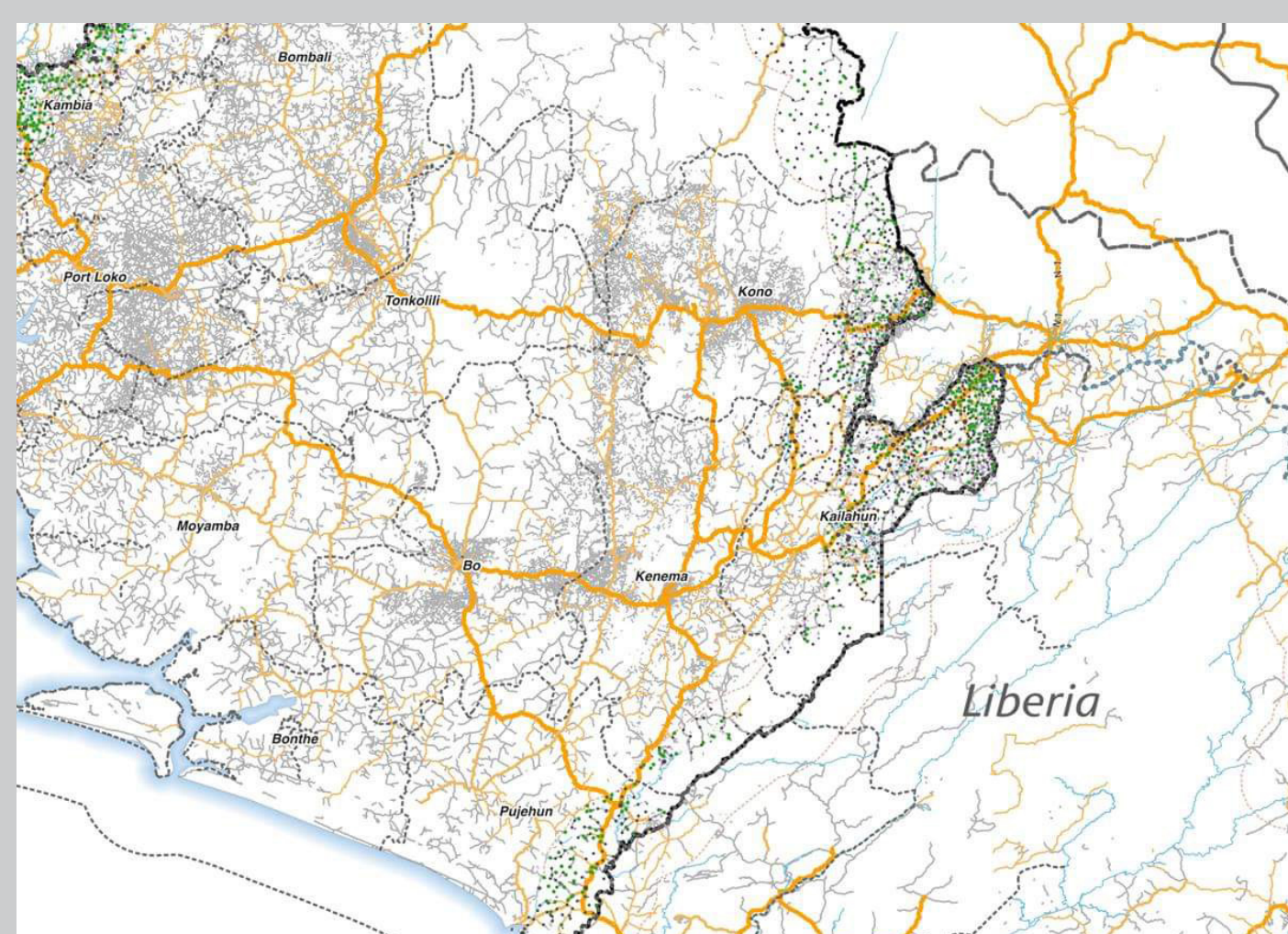
South Wales NHS COVID outbreak 2020 - NHS data

Community Mapping with OpenStreetMap DIY Smartphone Mapping for Public Health

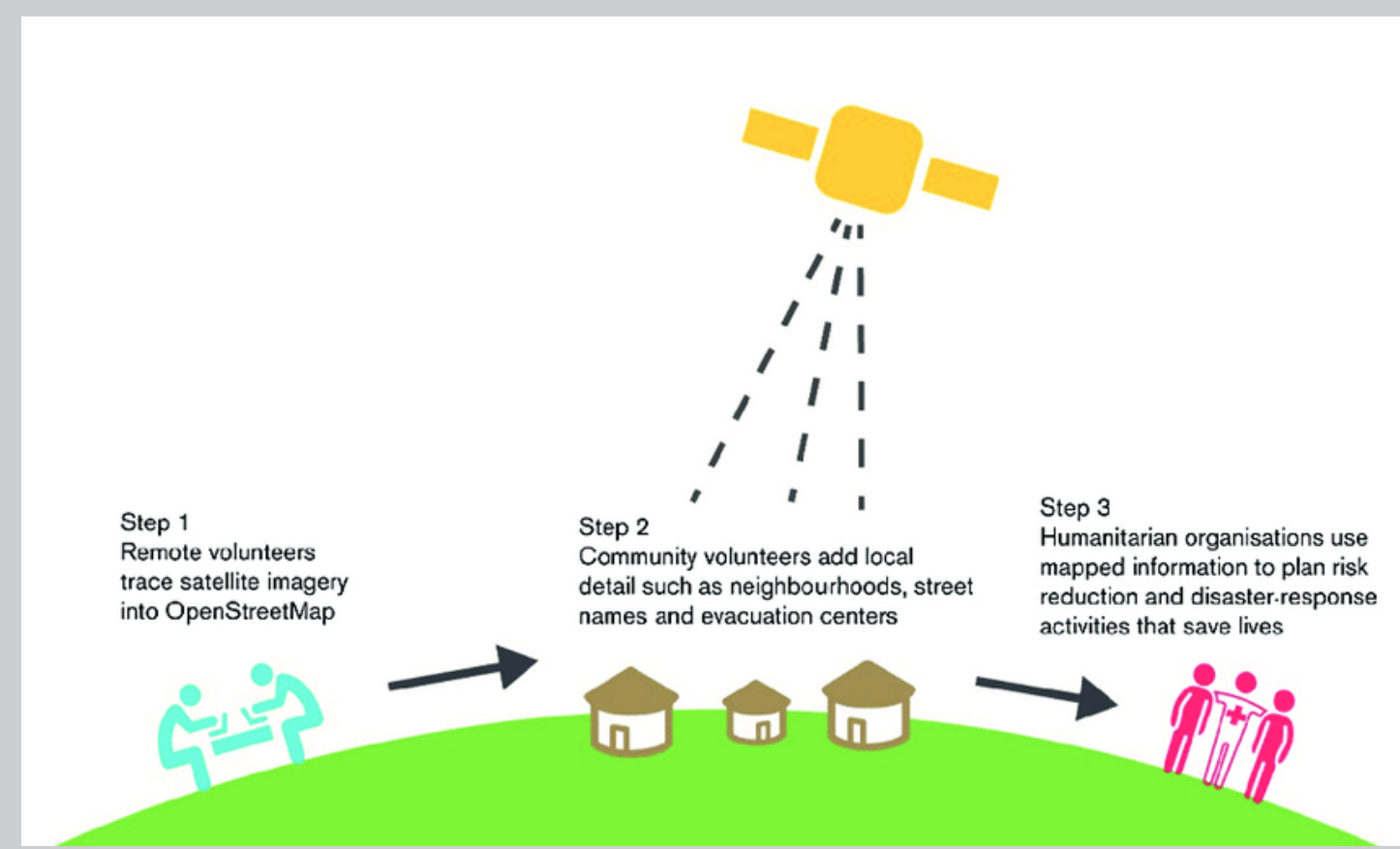
For the last decade OpenStreetMap has been used by humanitarians in some of the world's most vulnerable settings to enable neighbourhoods to represent local needs on global terms, have authorship of their own representation, and inform resilience and emergency interventions from the perspective of authentic community priorities.



Community members mapping their local access to water - Nakivale and Arua Refugee Settlements - Uganda (Humanitarian OpenStreetMap Team)



Mapping 'Ebola Alley' - transmission routes and community vulnerability - Sierra Leone (Medecins Sans Frontieres/American Red Cross)



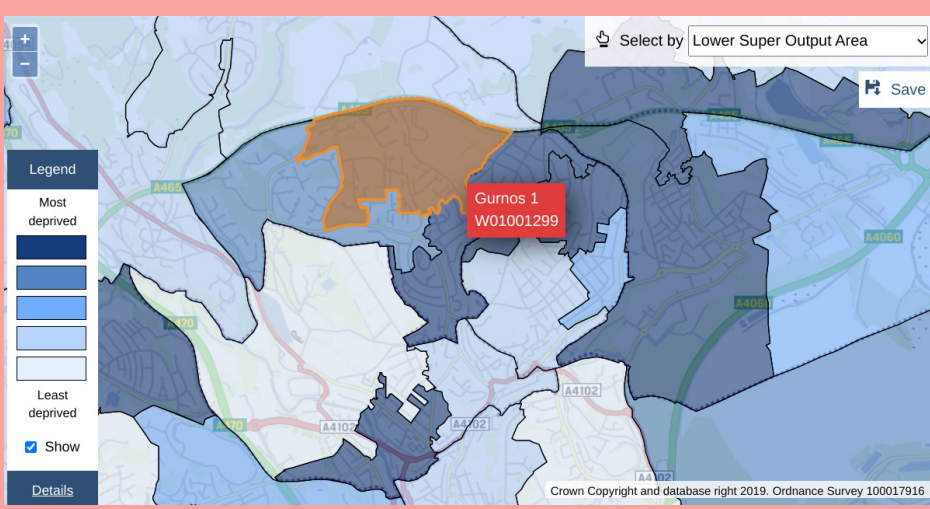
OpenStreetMap - global participation process (Image: Missing Maps)

Social determinants of wellbeing

COVID Vulnerability links with Deprivation Indices: Merthyr as a COVID hotspot ranking high on the WIMD (Wales Index of Multiple Deprivation)...

...and as a 'Food Desert'

The complex realities of access to healthy food and exercise as a core Public Health agenda (*Healthy Weights-Healthy Wales*)



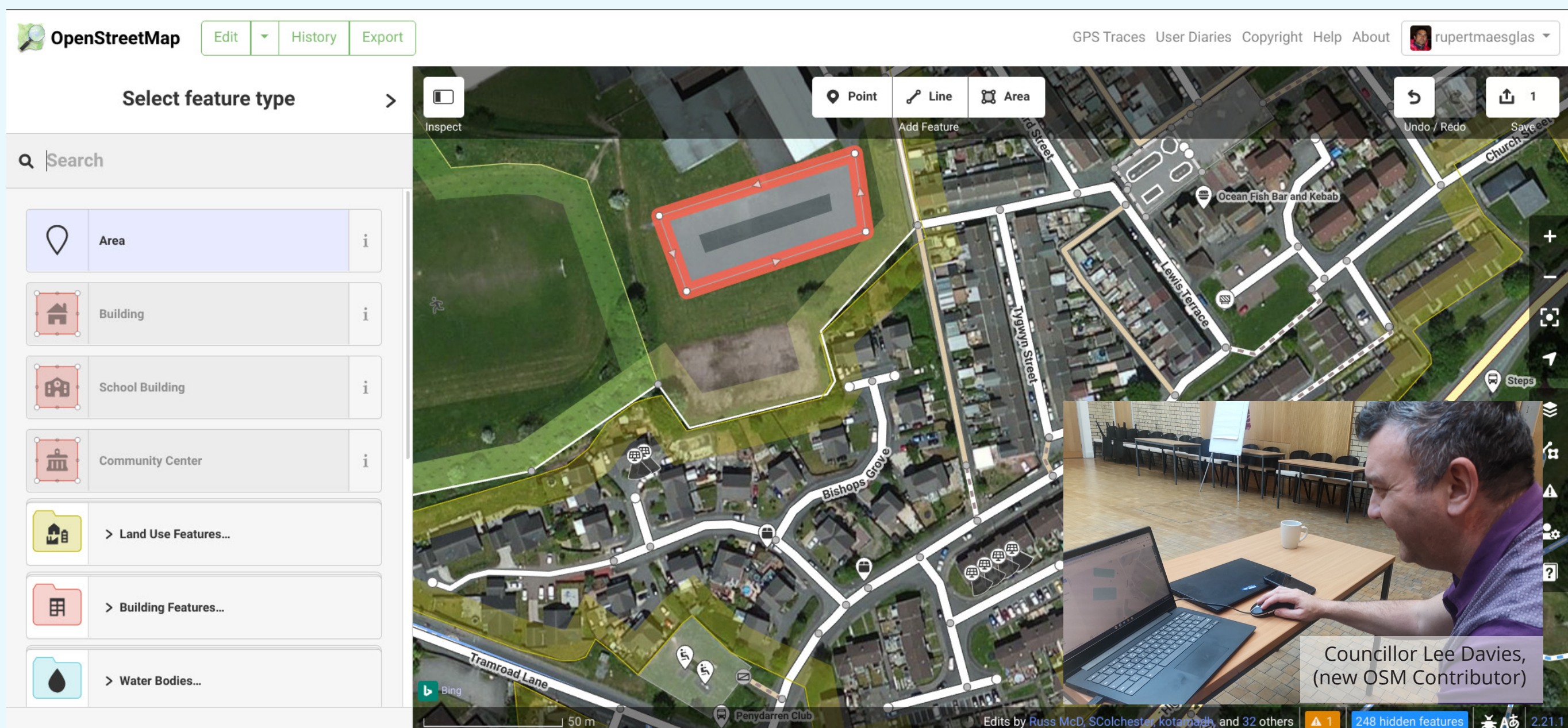
Deprivation Index Merthyr Tydfil - WIMD (Llywodraeth Cymru)

'...those areas of cities where cheap, nutritious food is virtually unobtainable. Car-less residents, unable to reach out-of-town supermarkets, depend on the corner shop where prices are high, products are processed and fresh fruit and vegetables are poor or non-existent.' Macintyre, 2007

Macintyre, S. Deprivation amplification revisited; or, is it always true that poorer places have poorer access to resources for healthy diets and physical activity? Int J Behav Nutr Phys Act 4, 32 (2007). <https://doi.org/10.1186/1479-5868-4-32>

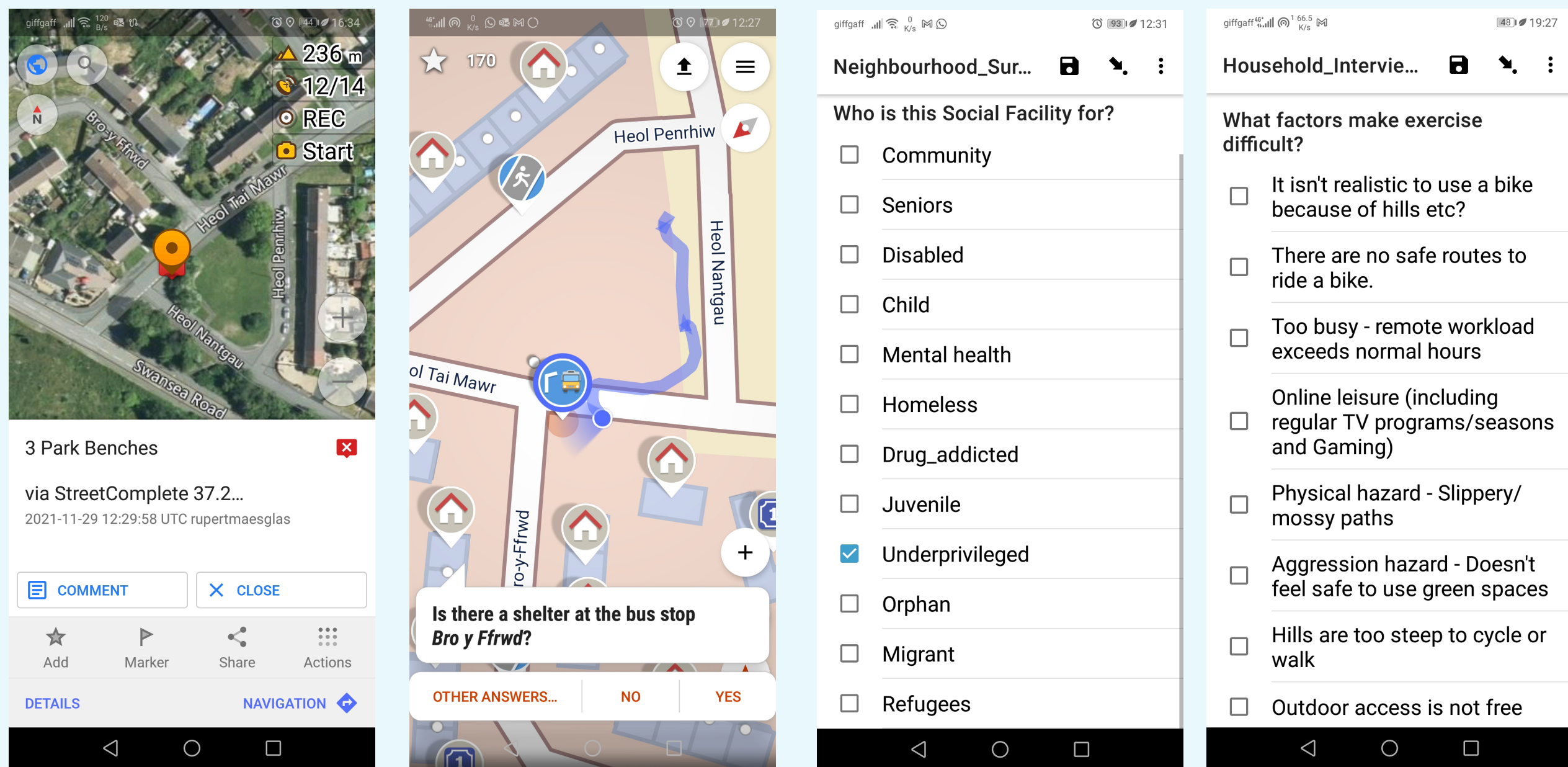
How Community Mapping Works

1. Satellite trace-mapping. 'A global network of local communities'



Remote-Mapping supported by a global team of 200,000 OpenStreetMap volunteers

OSMand, StreetComplete, ODK - smartphone apps used in community mapping



Free and OpenSource Software. Home-owned hardware.

Witnessed Realities: Community Indexed Health Metrics

2. Local field-mappers - adding locally-relevant values and actual lived-experience to the map, using smartphone mapping apps and community-workshopped neighbourhood surveys. This is a responsive survey process, where field-derived feedback can be incorporated in real time and surveys adapted per location. Data is dynamic, site-specific, and community-defined.



Community mapping volunteers in Merthyr Tydfil wards

Therapeutic Advantages: Social-Prescribing for mental health and wellbeing-participation, outdoor exercise, social activism

- Learning by doing: environmental/social science, numeracy, literacy, and life-skills
- 'Have a say' - own your healthcare decision-making
- Digital and physical inclusion and behavioural change - (UNSDG 17.6)

"Refreshing to have a constructive project after childcare... Even I learned new things about my neighbourhood" (Dowlais Community Mapper)

"Being outdoors and interacting with other people led to a massive improvement with my mental wellbeing" (Cyfarthfa Community Mapper)

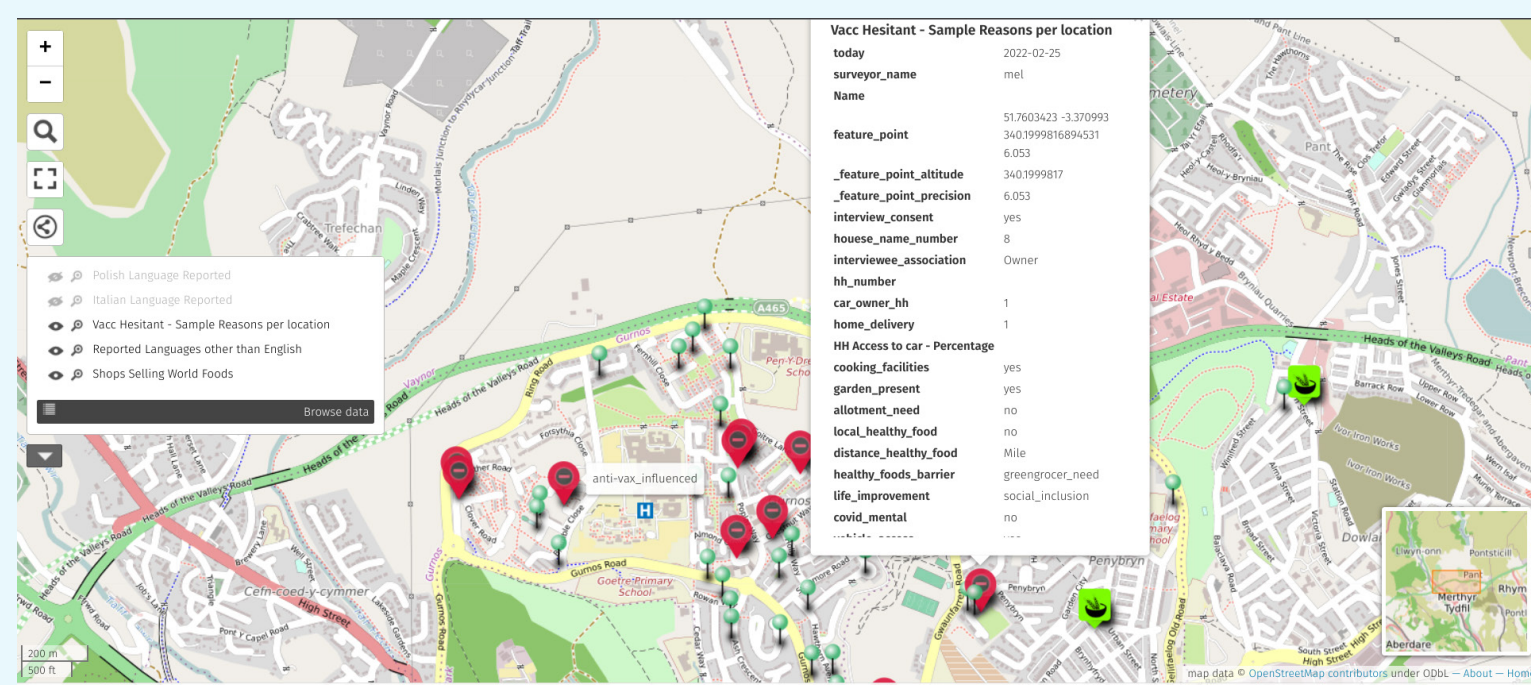
Mapping Community Priorities: Wild Food Foraging and Allotments



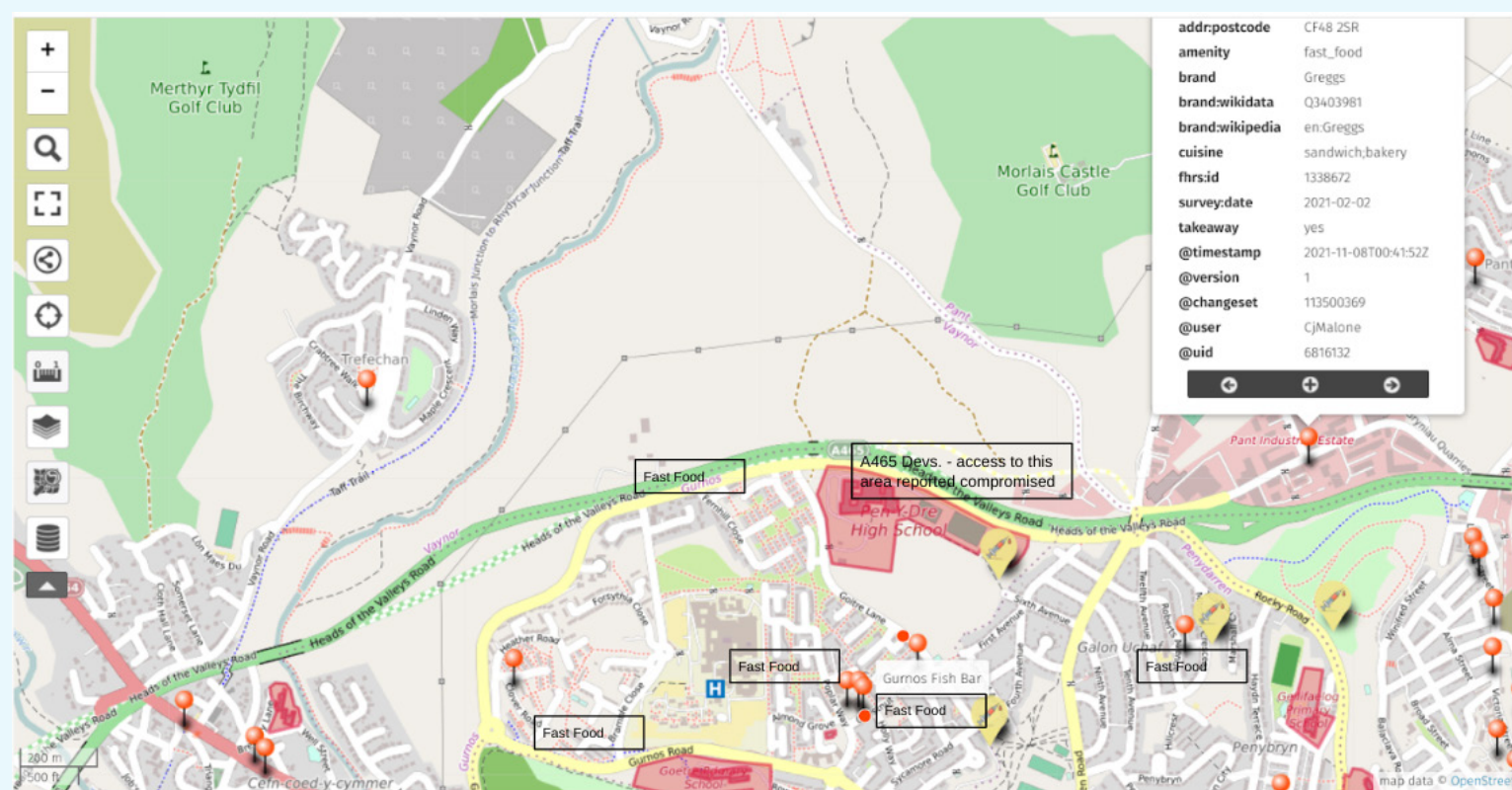
Foodscape mapping community assets like culturally-specific landmarks and shared local wisdoms (nutritional placemaking) allow knowledge transfer and promote inclusivity and collaboration. Meanwhile, mapping is both informative and therapeutic, creating a legible and organised community voice from the inside out.



Community Witnessing Real (survey) and Perceived (interview) geo-specific Barriers to Healthy Food



Vaccine Hesitancy: Map of reported attitudes towards vaccination, using PHW and community-identified indicators. It cross-references community infrastructure, language diversity and fresh food access during lockdown.



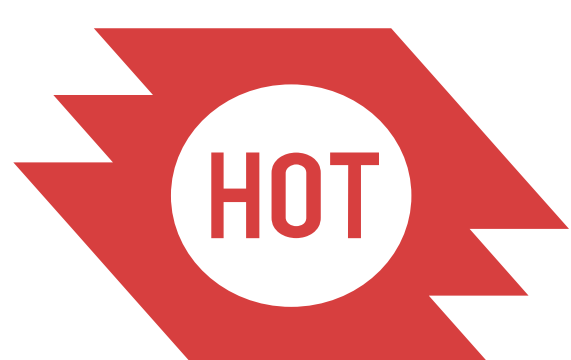
The Fast-Food Trap: School Students find themselves blocked from exercise by urban development, and restricted to less healthy food choices near their school.

3. 'An innovative platform for representing traditional values' Street-level 'indigenous' perspectives introduce multi-sector data correlations which can be visualised and utilised in human-centered, hyper-local maps. Real (Surveys) and Perceived (Interviews) can be correlated to infer qualitative/quantitative interdependencies.

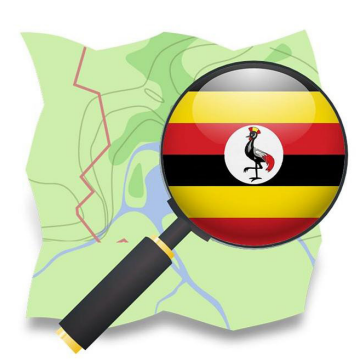
Outcome: Data co-production for reconnecting the NHS with its neighbourhoods.

Analytics:

- Site-specific behavioural insights and contextual analysis,
- Accessible, compatible, actionable data for evidence-based decision making, better resource allocation, and long-term Disaster Risk Reduction (DRR)
- Making clinical data legible over human geography layers for user-centred healthcare improvement



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