Aggregated Patient Journeys and no-show rates of Oximetry Outreach Network in East Anglia

Kieran Lee[1], Natalia Andrienko[2], Gennady Andrienko[2], Ibad Kureshi[3], Toni Staykova[4] and Ian Smith[1]

[1]Royal Papworth Hospital, Cambridge Biomedical Campus, Cambridgeshire, CB233RE, UK
[2]Fraunhofer Institute IAIA, Sankt-Augustin, 53757, Germany
[3]Inlecom Systems, Square de Meeus 38/40, Brussels 1000, Belgium
[4]Cambridge Medical Academy, 509 Clifford Allbutt, Cambridge CB2 0XY, UK

NHS Royal Papworth Hospital NHS Foundation Trust

Fraunhofer

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Introduction

Royal Papworth Hospital (RPH) performs over 10,000 home oximetry tests per year. For many patients slow roads and patchy public transport infrastructure in the catchment area make it difficult to access RPH itself for these tests. As a solution RPH developed a network of 21 exchange facility's (EF's), including 13 GP surgeries and 7 outreach clinics where oximetry devices can be collected for convenience. The organization of the nodes in this network was developed largely on availability rather than empirical scientific data, and the degree to which it reduces travel is unknown.
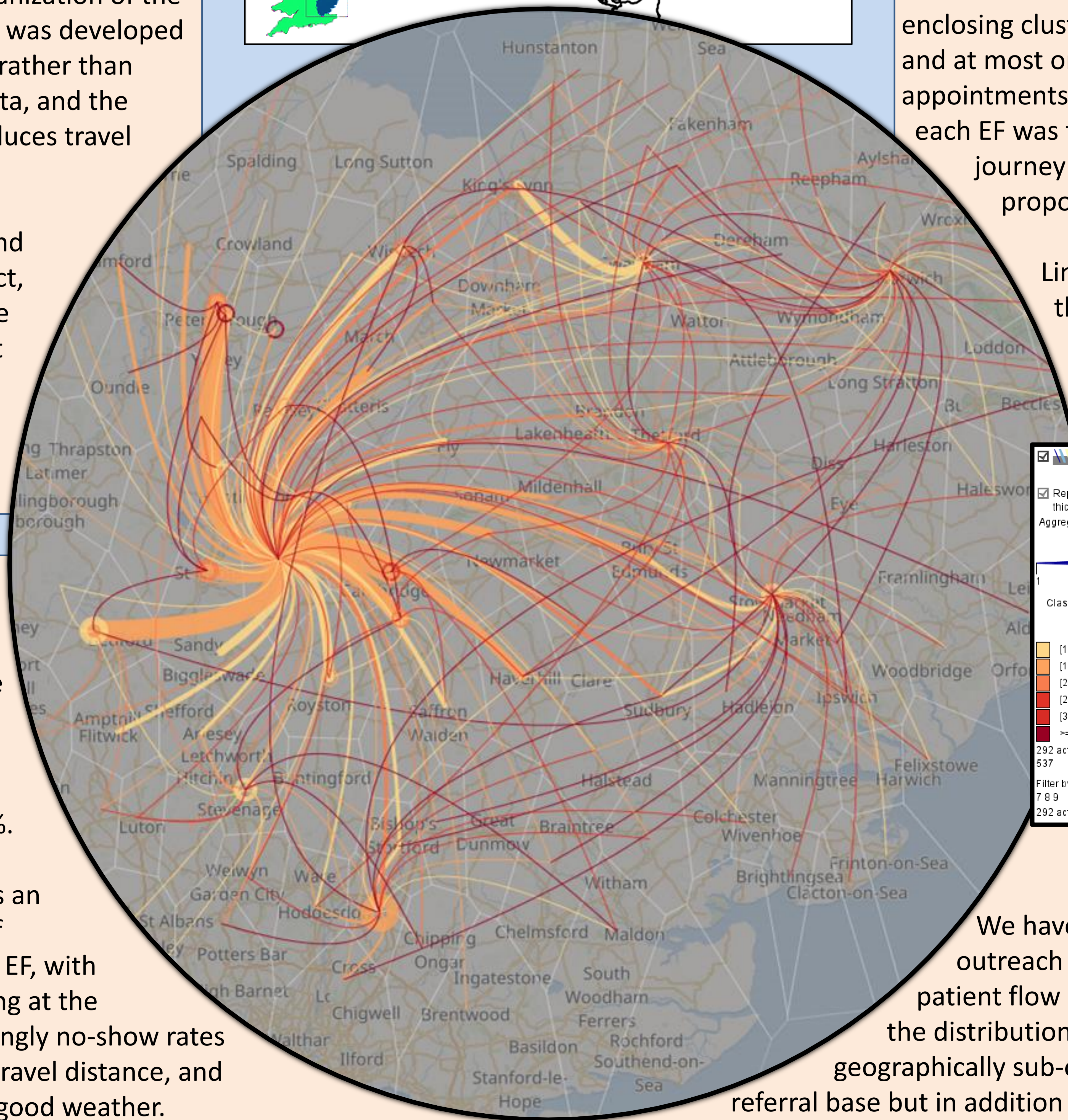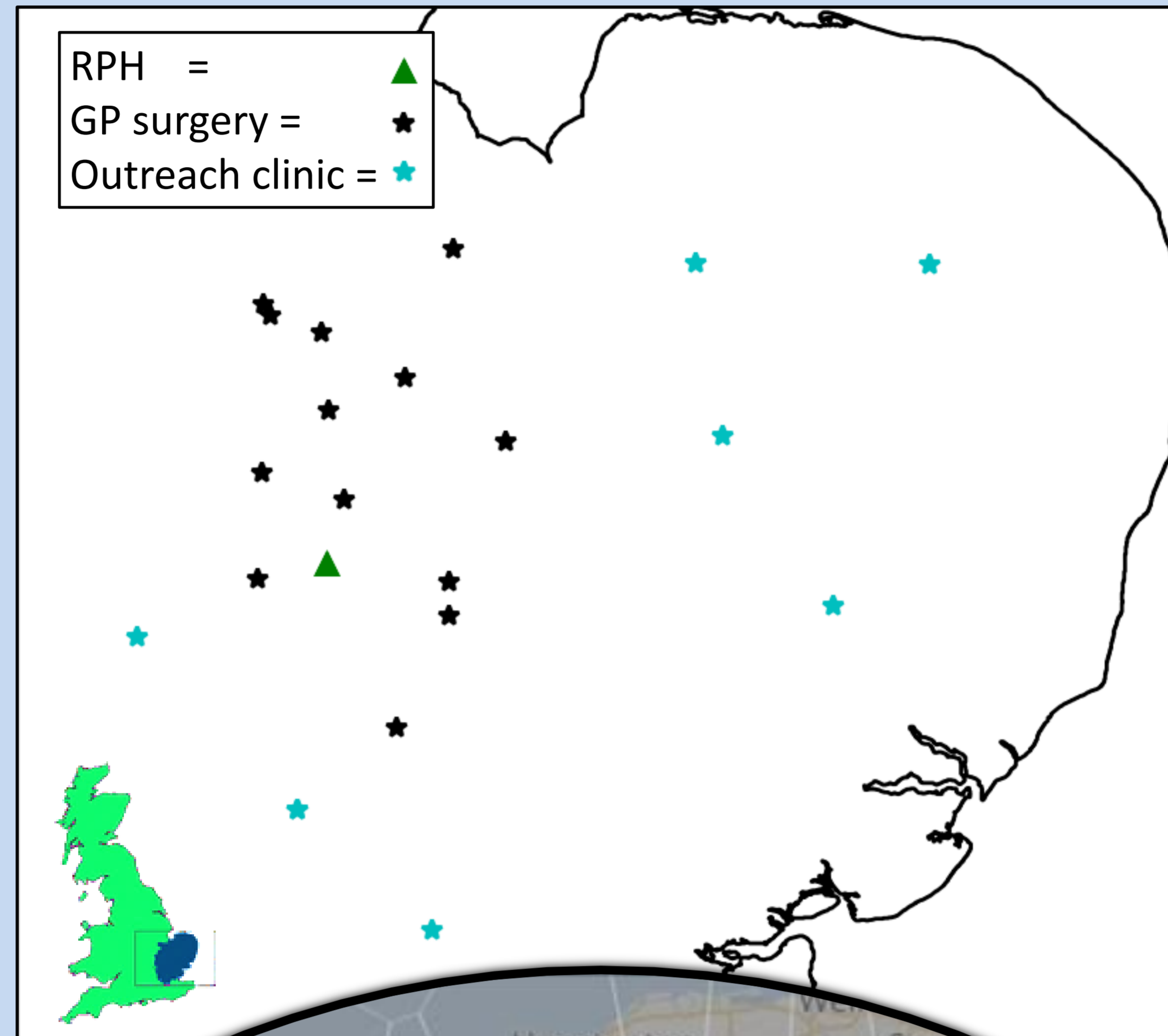
As part of the Track and Know (EU2020) project, we have examined the distribution of patient journeys over the EF network and the no-show rate of common routes.

RPH = ▲ (green triangle)
GP surgery = ★
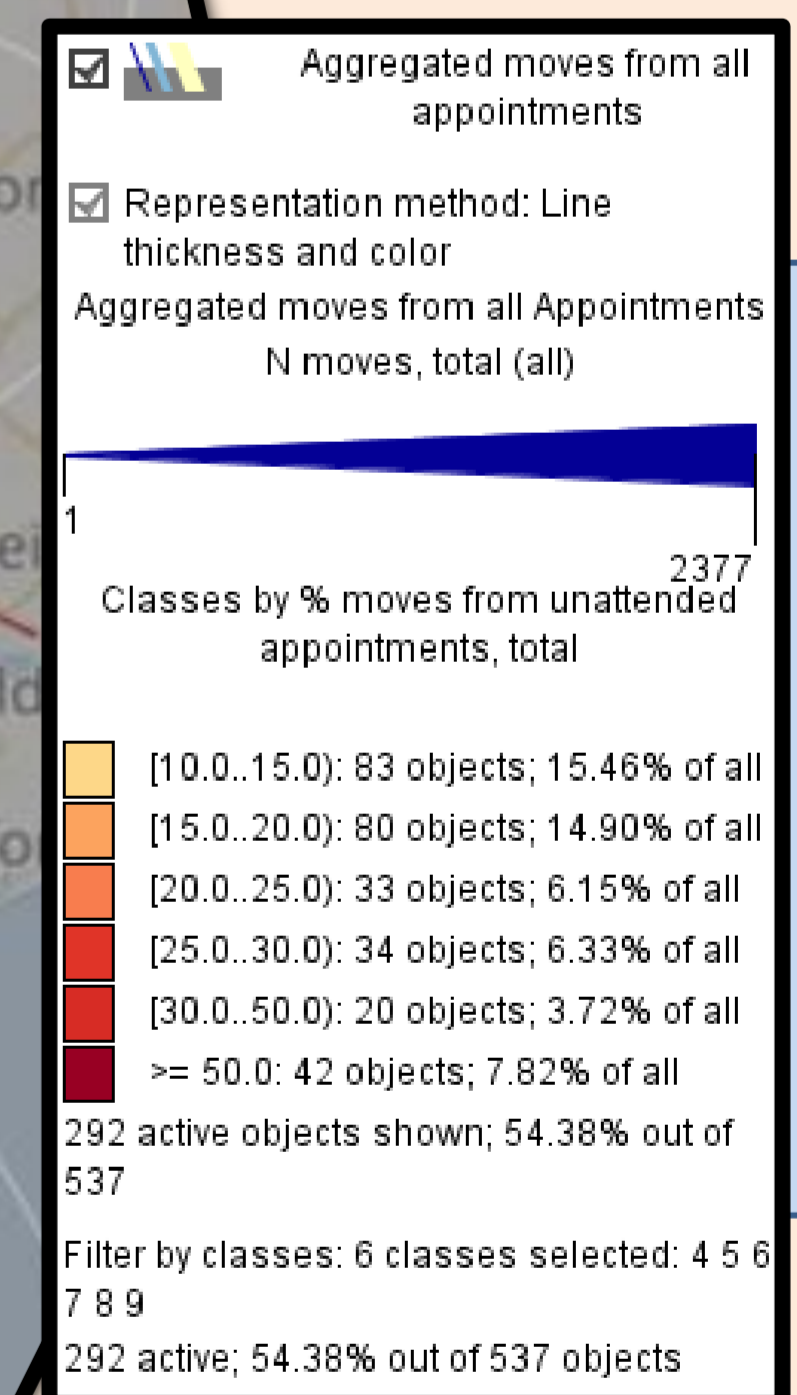Outreach clinic = ★ (cyan)

Methods

Data from 5 years (2013 – 2018) worth of oximetry test appointments were extracted from RPH's booking system.

Patient home postcodes and the location of EF's were used to reconstruct the likely journeys patients completed when attending their oximetry pick-up appointments. We then applied a bespoke tessellation algorithm, dividing the catchment territory into polygons enclosing clusters of patients' homes and at most one EF. The number of appointments from each territory to each EF was then mapped to display journey distribution and the proportion of no-shows.

Line thickness indicates the number of journeys scheduled between polygons. Colour indicates no-show rate.

Results

Over the 5 year period reviewed there was a total of 46,211 planed oximetry pick-ups. With a high no-show rate of 15.8%.

Additionally there was an uneven distribution of appointments at each EF, with >50% of bookings being at the hospital itself. Surprisingly no-show rates where not related to travel distance, and found to be higher in good weather.

The figure above of all route clusters with a no-show rate >10% shows patient journey to RPH from across the entire catchment area. Peterborough and Bedford having particularly busy routes despite alternative EF's being available in both locations.

Aggregated moves from all appointments
Representation method: Line thickness and color
Aggregated moves from all Appointments
N moves, total (all)
1 — 2377
Classes by % moves from unattended appointments, total
[10.0..15.0): 83 objects; 15.46% of all
[15.0..20.0): 80 objects; 14.90% of all
[20.0..25.0): 33 objects; 6.15% of all
[25.0..30.0): 34 objects; 6.33% of all
[30.0..50.0): 20 objects; 3.72% of all
>= 50.0: 42 objects; 7.82% of all
292 active objects shown; 54.38% out of 537
Filter by classes: 6 classes selected: 4 5 6 7 8 9
292 active; 54.38% out of 537 objects

Discussion

We have evaluated our oximetry outreach network using complex patient flow metrics and found that the distribution of clinics is geographically sub-optimal for our current referral base but in addition patients are frequently scheduled to visit a clinic which is not their closest, frustrating the whole effort of reducing travel and improving accessibility. We are developing alternative clinic booking processes and network nodes and will be re-assessing the accessibility and no-show rates in due course.

Track & Know