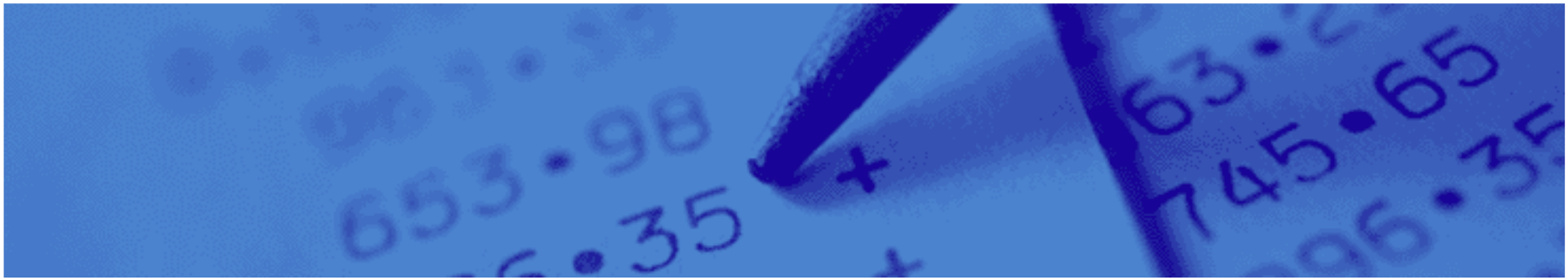

Can we measure homelessness? A critical evaluation of ‘Capture – Recapture’

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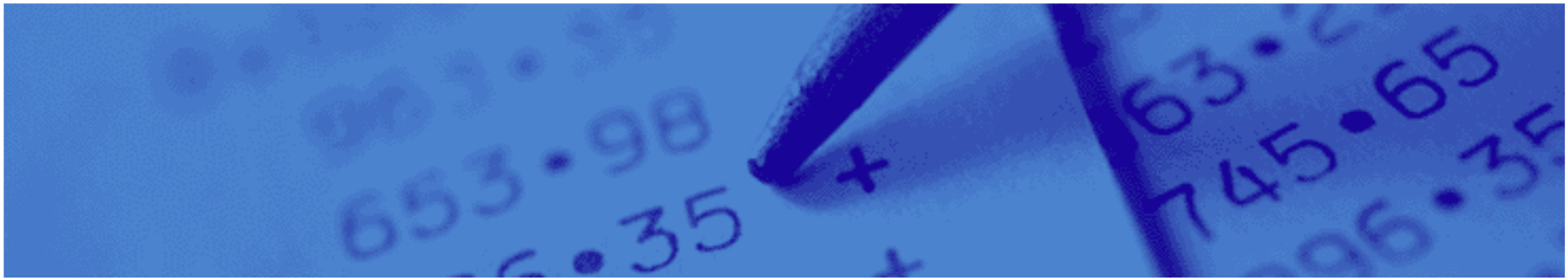

1. The need for accurate counts and their absence
2. Problems of definition
3. Problems of counting
4. ‘Capture −recapture’
5. Two UK studies
6. Evaluation

The need for accurate counts and their absence

- The persistence of visible street homelessness
- The estimated increase of invisible homelessness
- The need for accurate estimates
- The will to count?
  - Resources
  - Politics

Problems of definition

- What do we mean by ‘homelessness’? Is their a taxonomic description? Does it exist?
- Heterogeneous states of housing need.
- Homelessness as symptom
- Objective – v – subjective definitions

Problems of counting

- Homeless are a rare and elusive population. Simple counts (e.g. RSI in UK) are inaccurate:
- Undercount: have they all been found?
- Overcount: have they been previously counted
- Process: heterogeneous movement over time (in & out of target population)

Capture – Recapture (mark recapture)

- capture, count and mark a sample then re-capture at a later point noting overlap between the two captures.
- utilises information from duplicate cases to permit the number of people otherwise unobserved to be calculated .
- Commonly used in animal ecology and epidemiology
- technique rests on the principle of two or more independent observations of the same population.
- observations can be simultaneously of two sources representing approximately the same population, or they can be of the same source at two time points.

Capture – Recapture. Population estimate.

- To estimate the size of the population (*N*t)
  - number of persons observed at the first count (*N*1)
  - number of persons observed at the second (*N*2) [or subsequent counts]
  - number observed at both (*M*) [or each of subsequent] counts. Thus the estimate of the population (*N*t) is:

$$N_t = (N1 \times N2)/M$$

Capture- Recapture: Assumptions

- each member of the population must have the same probability of capture within each sample.
- dependency between samples should be avoided. An observation of an individual in one sample should not have any effect on the observation of that individual at the second or subsequent counts.
- overall numbers in the population should not be different at the time of each sample.

Capture-Recapture: Upholding Assumptions of the model

- ‘Tagging’. How can we (ethically) use reliable identifiers?
- Dependency. Within samples and between samples (Any two sources A and B are independent if the average probability of members of a population who appear in the intersection (overlap) is equal to the product of the average probabilities of appearing in A and in B) .
- Validity. Obtaining a measurable characteristic of homelessness.
- Reliability. The problem of classifying (false positives and false negatives)

Models

- Two sample model
- Two sample repeated time series
- Multiple sample. Log linear modelling techniques have been used to produce sophisticated models of the degree of interdependence between samples.
  - Logistical difficulties of multiple samples in study sites
  - Models dependencies but not false positives/ negatives

Model and data collection

- Used simple two sample time series model.
- Two samples over one week periods and repeated spring, summer, winter.
- Used local agencies to collect data, assuming most people categorised as homeless will come into contact with one or more of these.

Two UK studies: Plymouth and Torbay

- Both South Coast towns. Population: Plymouth 250,000. Torbay 125,000.
- Both large rural hinterlands. Plymouth ‘regenerating’ industrial city. Torbay, major tourist destination.
- Local records implied a high level of homelessness.

Homeless Definitions

- staying in a hostel
- staying in ‘bed and breakfast’ hotel
- sleeping rough
- staying in a squat
- staying temporarily with friends
- staying in non residential institutions (such as hospitals) where no other accommodation was available.
- staying in residential institutions catering for those excluded from, or unable to secure, other accommodation (e.g. homes for young offenders, women's refuges etc

Agencies and Tagging

- Agencies included: City housing departments; housing charities; ‘crisis’ charities; Benefits Agency; Police; Hospitals/Clinics; hostels; bed & breakfasts; ‘soup’ kitchens.
- Identifiers: Initials; Date of Birth; time in Plymouth/ Torbay.
- Utilised existing records/ simple data collection form.

How it was done

- Initial meeting of agencies representatives plus researcher visits.
- Training provided for data collection plus screening instrument.
- Researcher distributes/ collects data forms and makes ‘quality control’ visits.
- Data entered and SORT procedure in SPSS used. (some imputation permitted).

Estimates

- Two sample estimates at time points
- Time series sample estimates (provides mean/ median/ SD)
- Maximum Likelihood Estimator (MLE) used to calculate dependency overlap.
- Longitudinal data on individuals.
- Sample survey of individuals (housing, employment, health histories etc)

CAPTURE/RECAPTURE - ESTIMATE OF NO. OF PEOPLE IN PLYMOUTH IN SEVERE HOUSING NEED

ENUMERATION 1

TOTAL CASES COMMON TO BOTH CAPTURE1 AND CAPTURE2 = 366

Enumeration 1 Capture 1 417 Enumeration 1 Capture 2 428

(417 x 428)/366 = *488*

ENUMERATION 2

TOTAL CASES COMMON TO BOTH CAP1 AND CAP2 = 352

Enumeration 2 Capture 1 406 Enumeration 2 Capture 2 386

(406 x 386)/352 = *445*

ENUMERATION3

TOTAL CASES COMMON TO BOTH CAPTURE1 AND CAPTURE2 = 329

Enumeration 3 Capture 1 369 Enumeration 3 Capture 2 360

(369 x 360)/329 = *404*

MEAN OF ENUMERATIONS = 446

Evaluation

- Once developed can be reused by a local authority.
- Resource intensive
- Sophisticated models available, but all dependent on data collection
- In small studies dependencies can be more easily ‘mapped’ (individuals can be followed through the ‘tags’.
- Facilitated by geography in examples
- Sample surveys demonstrated complexity of housing need pathways

Conclusions

- Method still not that widely used (used by 5 % of UK authorities. Also Toronto, Budapest, Adelaide, Los Angeles).
- Political resistance to sophisticated methods of counting?
- Often used to measure ‘street homeless’ (but improvement on simple headcounts).
- Sophisticated statistical modelling techniques now developed, but data collection quality is crucial.
- Geography/ size of area/ migration flows will always be key factors.