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Linking Smart Meter Data and Financial Records to Develop an Area-Level Fuel Poverty Indicator

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Introduction & Background

The current approach to measuring fuel poverty in England, Low Income Low Energy Efficiency (LILEE), systematically underestimates the condition in low- and middle-income homes. This is due to its inability to accurately respond to macroeconomic shocks (e.g., energy price inflation) and its overstatement of energy inefficiency as the principal driver of fuel poverty. This inaccuracy poses a critical policy challenge: inaccurate measurement precludes meaningful alleviation. In response, the current study develops an area-level fuel poverty indicator that better captures the realities of fuel poverty by harnessing digital footprints: smart meter data and financial records, acquired from the Smart Energy Data Service (SENSE) and the Financial Data Service (FINDS), respectively.

Objectives & Approach

The aim is to develop a granular, area-level fuel poverty indicator (based on Lower Super Output Areas—LSOAs) through the linkage of smart meter and financial data. This approach facilitates the examination of the spatial and temporal overlap between low absolute energy consumption (SENSE) and low energy expenditure (FINDS). The proposed approach aims to complement or supplant the government's official fuel poverty statistics, which are typically modelled using relatively small, static survey samples, by providing dynamic and responsive insights into energy affordability at regular intervals (e.g., monthly or seasonal).

Relevance to Digital Footprints

Energy and financial data represent rich digital footprints of sensitive social factors, which are key to a better understanding of fuel poverty in the UK. The SENSE and FINDS data are disparate digital footprints encoding complex consumer be-

haviours; yet their linkage could possess significant utility as an alternative resource for generating area-level fuel poverty insights.

Conclusions & Implications

The SENSE and FINDS collaboration is ongoing; we present a methodological framework for linking two independent datasets and new analytical approaches enabled by the linkage of energy and financial data. The expected outcomes are more accurate and responsive area-level fuel poverty indicators. This is particularly pertinent to England, where competing fuel poverty statistics are needed to overcome the weaknesses of the LILEE approach and to enable targeted measures for a fair energy transition. Further, the proposed indicator could harmonise diverging measurement standards across England and the devolved nations (Scotland, Wales and Northern Ireland), facilitating essential comparative statistics.

Keywords

data linkage, financial data, smart meter data, fuel poverty, financial precarity

