Analytics and Data Science

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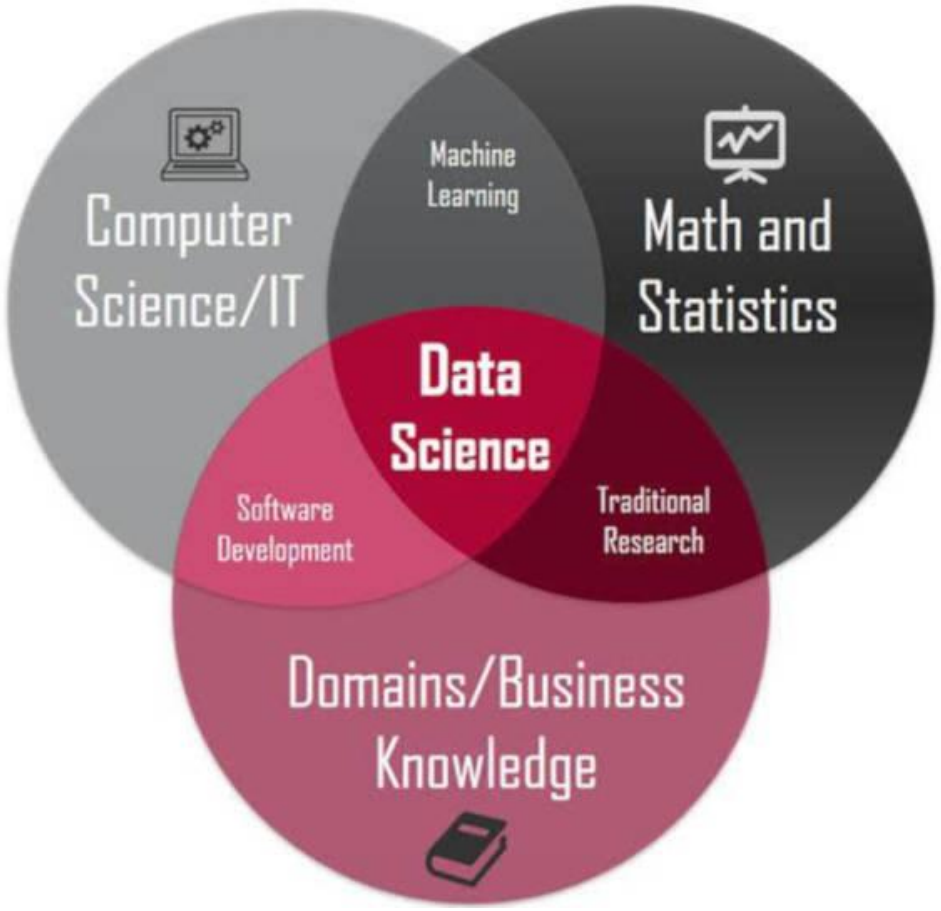
WHAT IS ANALYTICS?

ANALYTICS IS THE DISCOVERY, INTERPRETATION, AND COMMUNICATION OF MEANINGFUL PATTERNS IN DATA; AND THE PROCESS OF APPLYING THOSE PATTERNS TOWARDS EFFECTIVE DECISION MAKING

WHAT IS DATA SCIENCE?

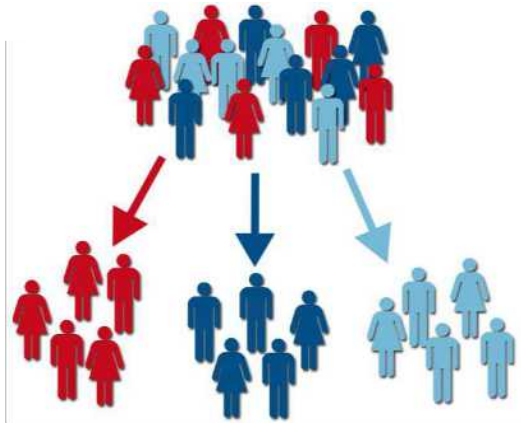
A MULTI-DISCIPLINARY FIELD THAT USES A COMBINATION OF STATISTICAL ANALYSIS, PROGRAMMING, AND DOMAIN EXPERTISE DEPLOYED IN A REAL-WORLD ENVIRONMENT TO EXTRACT KNOWLEDGE AND INSIGHTS FROM DATA

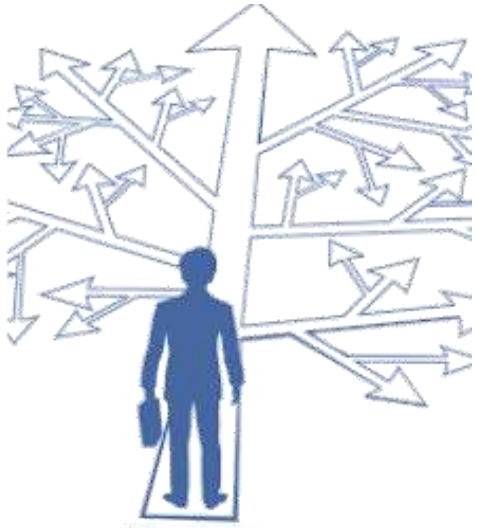
> **COMPANIES THAT INVEST IN ANALYTICS HAVE 33% HIGHER REVENUE GROWTH, 12 TIMES MORE PROFIT GROWTH AND 32% HIGHER RETURN ON INVESTED CAPITAL THAN THEIR PEERS**



MAKING BEST USE OF ALL OUR DATA

BUILDING A BETTER PICTURE OF THE PAST TO HELP US PREPARE FOR THE FUTURE





PLANNING

- Plan and prepare for the future by understanding trends & forecasts, thinking about what might happen next and creating early warning tools and signals

PRIORITISING

- Prioritise and target activity to people and places that need it the most, grouping and clustering cohorts and identifying key risk and protective factors

PREDICTING

- Predict outcomes before they arise, to support targeting of activity and help intervene earlier, prevent or delay crisis

ESSEX CENTRE OF DATA ANALYTICS

PARTNERSHIP VENTURE BETWEEN ESSEX COUNTY COUNCIL, ESSEX POLICE AND ESSEX UNIVERSITY THAT SEEKS TO PROMOTE THE USE OF DATA SHARING AND ANALYTICS TO IMPROVE OUTCOMES FOR LOCAL PEOPLE

- Sharing data with our partners in a safe, secure and ethical way with a data sharing platform and independent ethics committee
- Connecting people, building capability and expertise, with good practice frameworks. ethical and legal processes
- Understanding citizen views on data sharing and building data literacy learning agenda for leaders

Essex County Council

ESSEX POLICE
Protecting and serving Essex

University of Essex

USE CASE STUDIES FOR ESSEX

Essex County Council

Helping us prepare for the future

"Using hindsight and insight to generate foresight"

- **Understanding historic trends and drivers of demand**
- **Taking an evidence driven view of future demand to assist with service planning**
- **Modelling and simulation to test future demand scenarios**
- **Planning budgets and resources (short to medium term) and strategic direction (long term)**

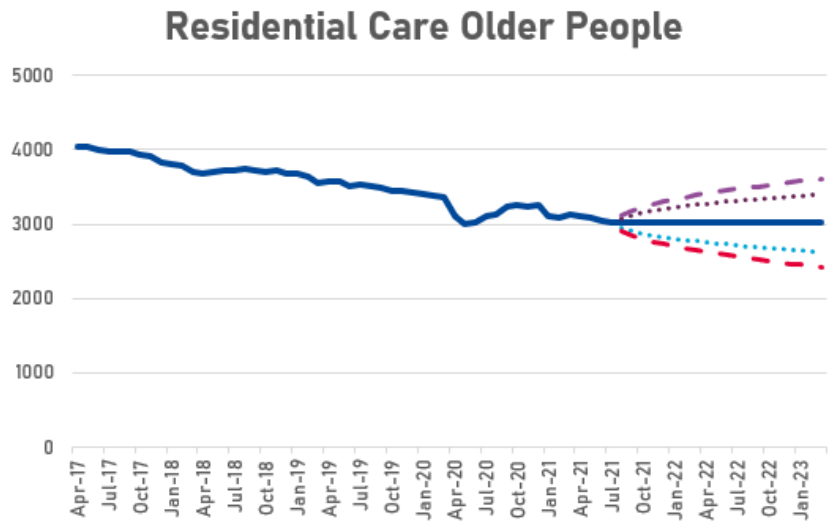
ASC DEMAND FORECASTS AND RECOVERY

FORECASTING SERVICE DEMAND FOR ADULT SOCIAL CARE

Aim(s):

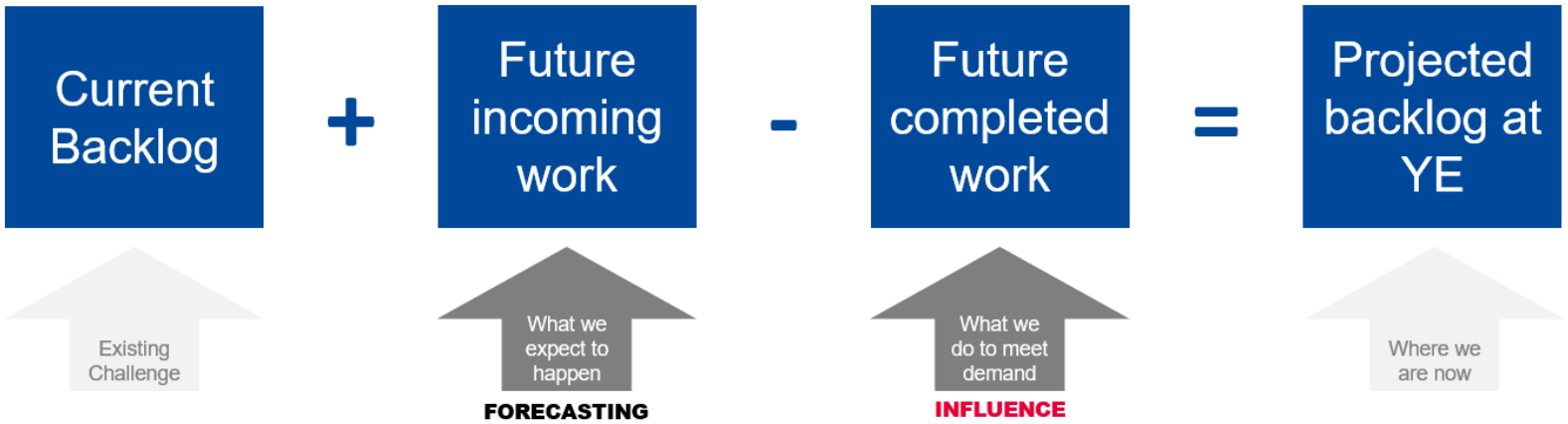
Forecast demand for variety of adult social care services for medium term budget setting

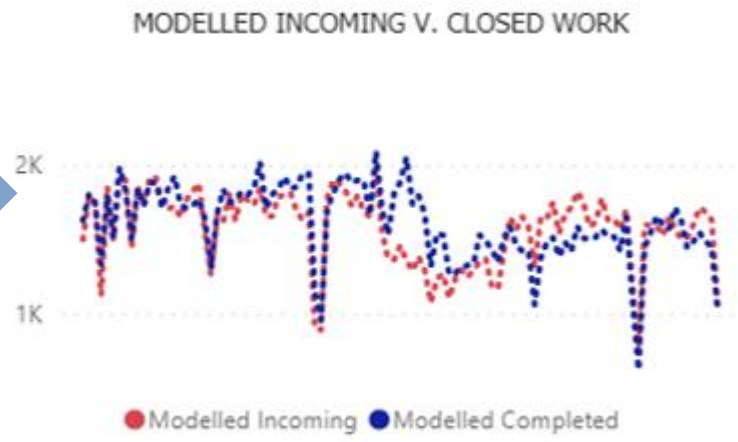
Demand Planning and testing operational scenarios



Outputs & Impact:

- Series of forecasts enabling evidence driven budget setting for multitude of social care services
- Forecasts inform service planning simulation model to identify resource requirements for managing demand





PRIORITISING AND TARGETING ACTIVITY

Cluster analysis, segmentation, & profiling

"Grouping together people or geographies based on their similarities and differences"

- **Condensing large volumes into manageable distinct groups or profiles**
- **Targeting the right resources to the right groups at the right time**
- **Profiling characteristics, behaviours, and actions of service users to better understand the customer**
- **Making big data relatable**

REVIEW PRIORITISATION

TARGET ACTIVITY WHERE IT CAN CREATE THE MOST IMPACT

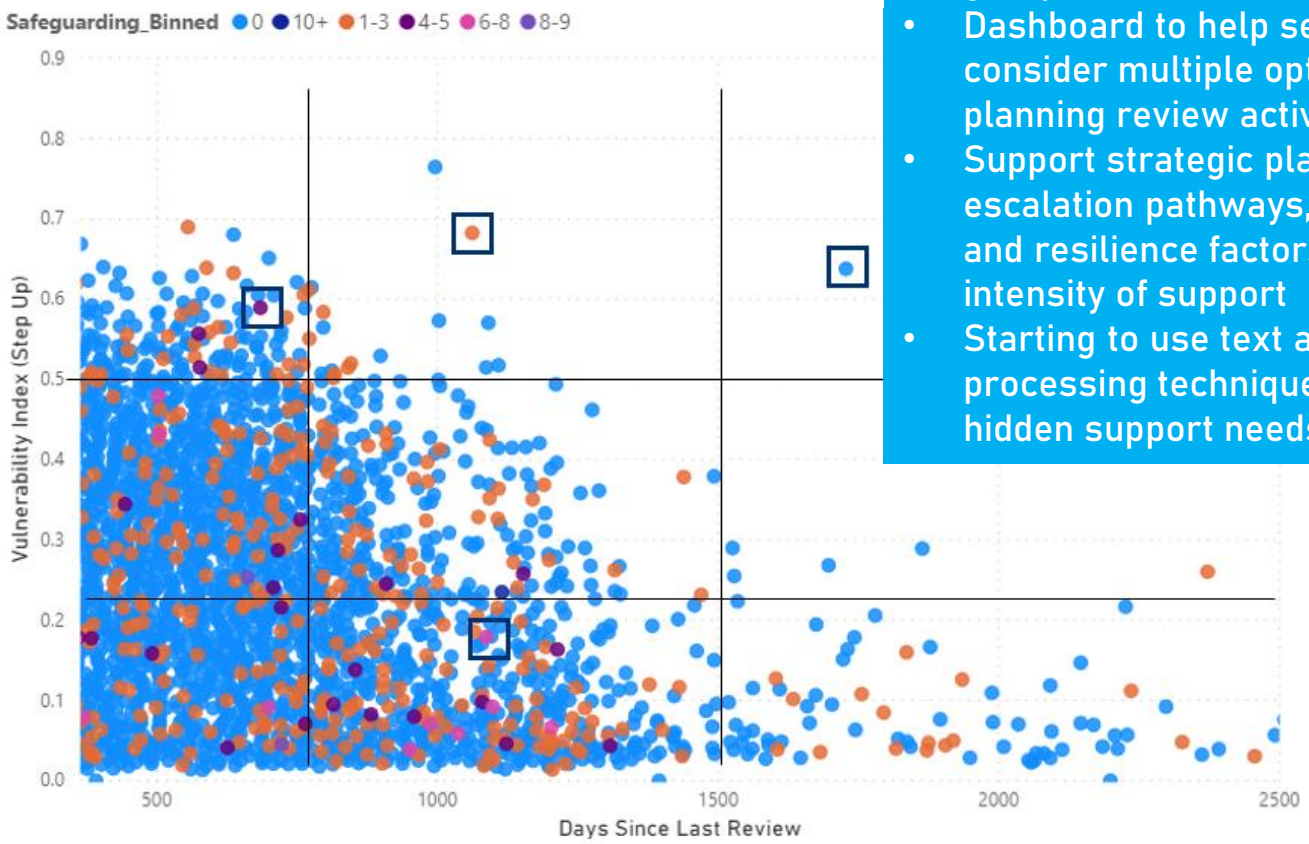
Aim(s):

Predict who in our adult social care service user population is likely to require '*greater*' support within the next 2 years (escalation risk)

Support prioritisation of reviews based on 'need' (supplementing expertise of staff)

Risk and resilience factors:

- Housing deprivation
- Education and employment deprivation
- Cost of services
- Age
- Time in Service
- Specialism
- Locality
- Marital status
- Living environment
- Safeguarding episodes
- Time since last review



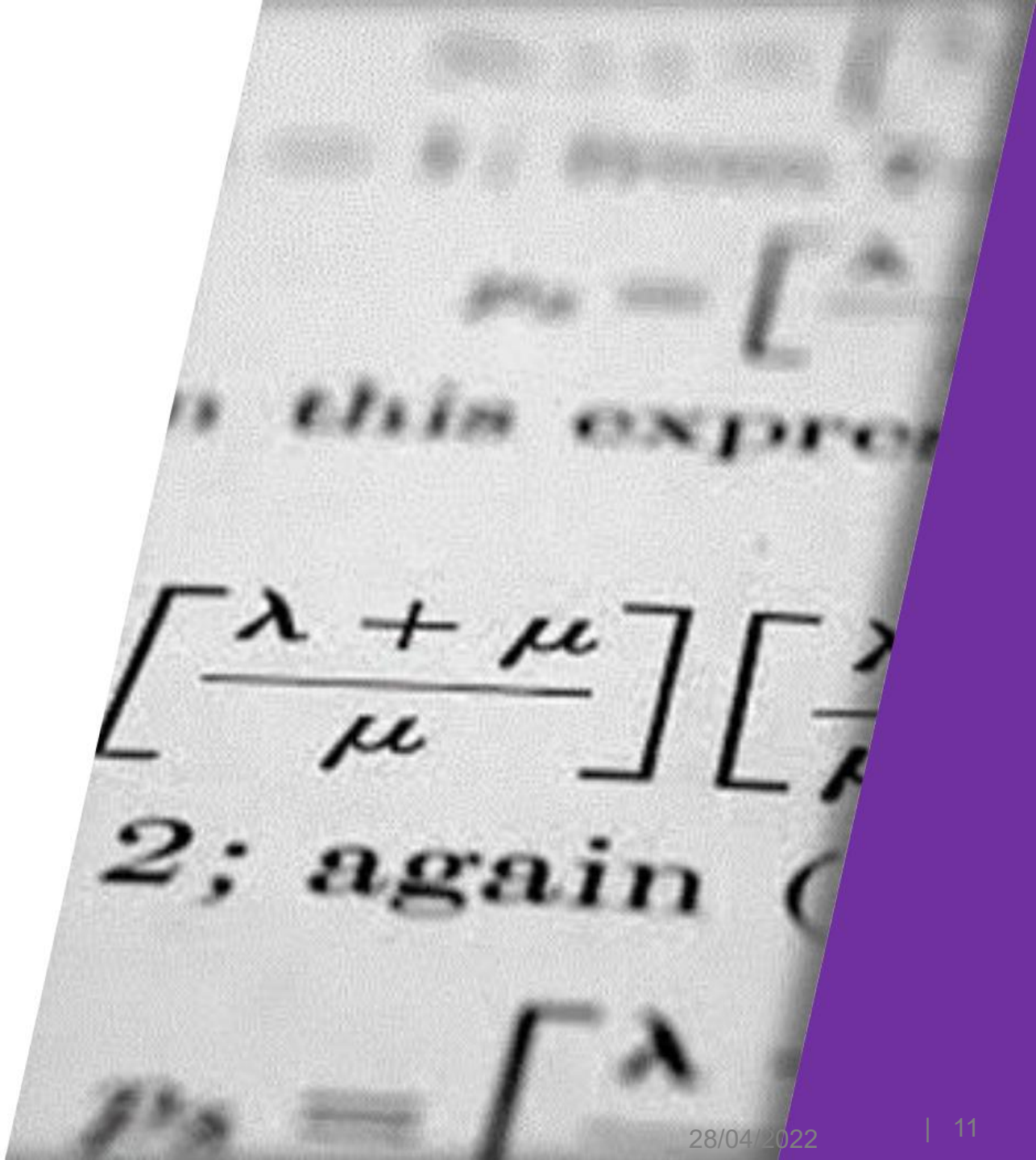
Outputs and Impact:

- Accurate models that predict risk of service escalation for different needs groups
- Dashboard to help service teams consider multiple options when planning review activity
- Support strategic planning, identify escalation pathways, determine risk and resilience factors that influence intensity of support
- Starting to use text and language processing techniques to identify hidden support needs in case notes

Predicting outcomes

"An algorithm can predict someone's behaviour faster and more reliably than humans can"

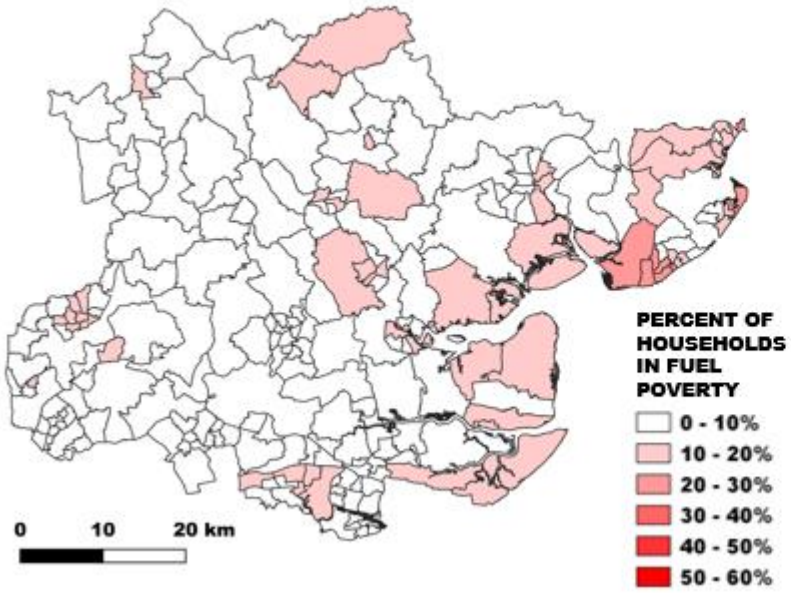
- **Understanding risk and resilience factors that lead to an outcome – and predicting outcomes based on drivers**
- **Stratifying risk in individuals, populations, cohorts, geographies to enable preventative action**
- **Creating risk and resilience pathways and profiles**
- **Modelling return on investment (and SROI) to optimise activity**



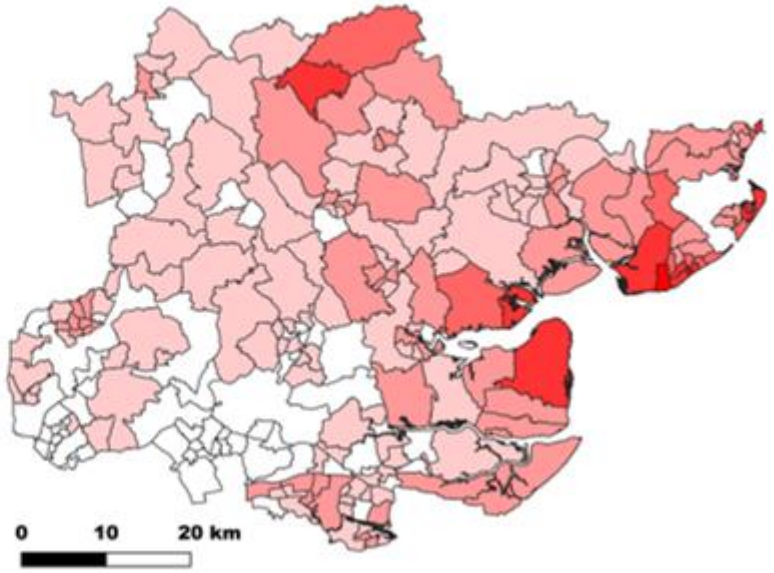
FUEL POVERTY AND COST OF LIVING

UNDERSTANDING IMPACT OF POLICY CHANGE AND NATIONAL EVENTS ON OUR RESIDENTS

Currently at risk of fuel poverty



At risk with the 52% price cap rise



Aim(s):

Model fuel poverty based on hypothesised future scenarios

Determine key hot spots where there is a greater risk of fuel poverty

Outputs and Impact:

- An additional 60,000 households at risk of fuel poverty
- Identified key localities (not evenly distributed)
- Found 3 key profiles of households most affected

ESSEX'S DATA STRATEGY

Essex County Council

DATA IS EVERYONE'S BUSINESS

The 12 ambitions to achieve by 2025 that we have committed to.....

COLLECT AND SHARE DATA TO IMPROVE OUTCOMES

1. We adopt data standards to collect consistent and unified, obtaining data by design
2. We have systems put data integrity up front and central; adhering to data protection principles
3. We safely share data using a placed based approach to data management, looking beyond organisational boundaries to ensure we have a single views of our residents & their needs

PROACTIVELY FIX PROCESSES

4. We have clearly defined, and well understood datasets owned by business areas
5. We have sustainable & flexible cloud-based technologies that allow us to store, integrate and report on all varieties of data
6. We have robust processes in place to understand the quality of our data and our data assets

TURN INSIGHT INTO ACTION

10. We adopt a data enabled culture with strong sponsorship of our data assets and defined roles to help us manage
11. The right people have access to the right information at the right time and to know how to use it to make good decisions.
12. We are responsible with our data - ethical and transparent about how we make decisions using data

CONNECT TO BUILD CAPABILITY

7. We have communities of practice that come together to share data skills, best practice and built capability
8. We cultivate and retain best in class advanced analytical capabilities building careers in data not just skills
9. We make best use of data and analytics, aligned to business prioritise, visible in a joint insight programme