Real time indicators:
Opportunities, challenges and next steps for national statistical institutes

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Outline

- Why real time indicators?
- Challenges and limitations
- Suggested approach
- Next steps

Disclaimer

- The views expressed are my own, and are not necessarily those of the Office for National Statistics
- Although I focus on the UK experience, statistical agencies in other countries have made great progress
- A more comprehensive discussion paper to follow

Why real time indicators?

What are real time indicators?

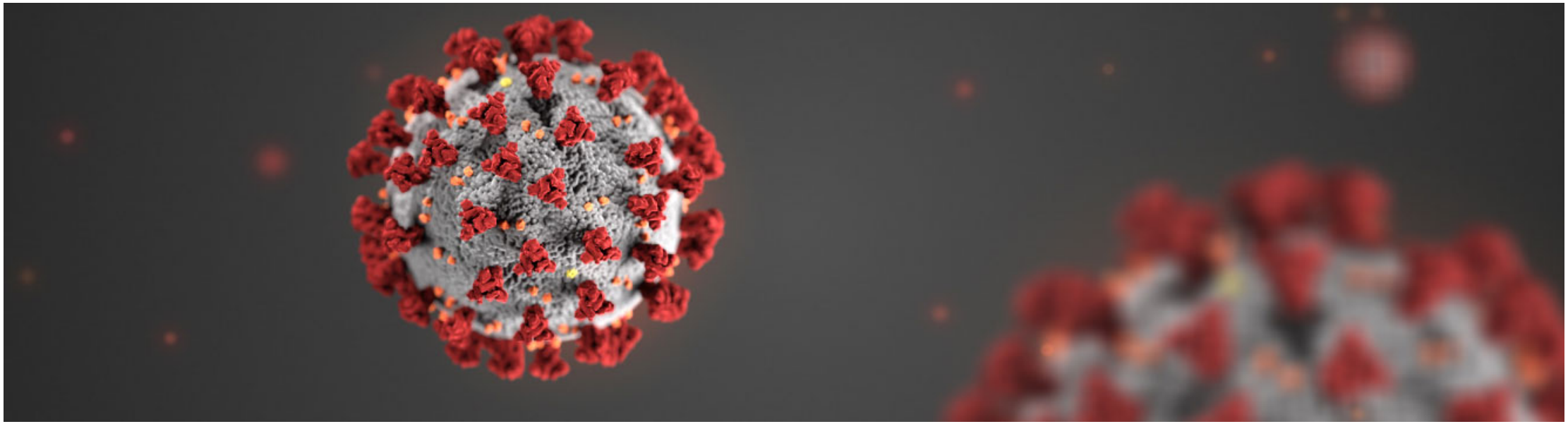
- Data which is published early (near real time) or at higher frequencies which is both *timely* and *intrinsically informative*

  - aka: ‘high frequency data’, ‘faster indicators’

- They are generally *not* official statistics
- They potentially offer a vast array of timely and relevant data on a wide range of economic and social areas

The pre-pandemic context

- Monthly GDP estimates and *Faster Indicators* bulletin
- Using some admin data, working with 2 financial institutions
- ONS Data Science Campus established in 2017



New questions needed answers - urgently

- Are people socially distancing? Staying at home?
- How is the lockdown effecting consumer spending?
- Will business take-up furlough and other schemes?
- What impact on business turnover? How many firms closed?
- Which regions & demographic groups are hardest hit?
- Who is working from home? Who is home schooling?
- What is the current COVID infection rate across the UK?
- How widespread is vaccine hesitancy?

Challenges and limitations

Current ONS real time indicators

- UK flights (EUROCONTROL) [d, w]
- Online job adverts by region and industry (Adzuna) [d, w]
- Seated diner restaurant reservations (OpenTable) [d, w]
- Retail footfall by category (Springboard, BEIS) [d, w]
- Traffic camera data: vehicles and pedestrians (ONS) [d]
- GB motor vehicle traffic by type (Department for Transport) [d]
- UK ship visits by category (exactEarth, ONS) [d, w]
- Index of online price changes for food and drink products (ONS) [w (discontinued)]
- Company incorporations and dissolutions (Companies House) [w]
- CHAPS spending on debit and credit cards (Bank of England) [d, m]
- Value Added Tax turnover and expenditure diffusion indexes (HMRC) [m, q]

Source: ONS - *Economic activity and social change in the UK, real-time indicators* * **Note:** (d) daily, (w) weekly, etc

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Third party data suppliers

Data science methods

Administrative data

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The 5 dimensions of statistical quality*

Dimension	Key questions for real time indicators
Relevance	Do they meet users' needs? Are there significant gaps?
Accuracy and reliability	How close are estimates to true value? How consistent?
Timeliness	Time lag between period estimated and release date?
Coherence and comparability	Can they be reliably combined in different ways or uses? How do they compare between regions, sectors, over time?
Accessibility and clarity	Easy to obtain? Fomats? Metadata? Easy to understand?

Source: Eurostat (2003) *Methodological documents - Definition of quality in statistics*, Doc. Eurostat/A4/Quality/03/General/Definition

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Granularity and richness	Does the level of detail enable you to drill down? Are there many variables for analysis?

Source: Eurostat (2003) *Methodological documents - Definition of quality in statistics*, Doc. Eurostat/A4/Quality/03/General/Definition

Timeliness and relevance

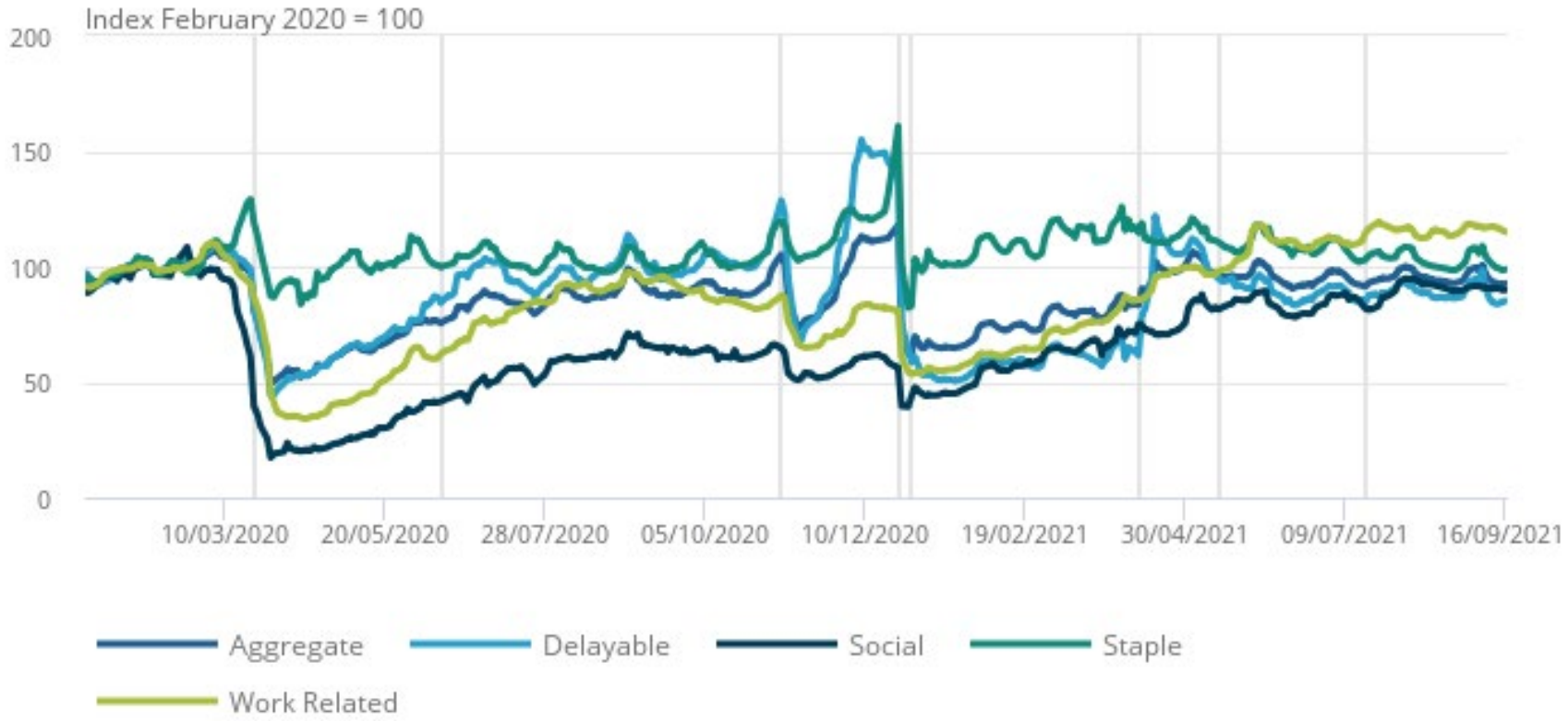
Volume of overall daily retail footfall, compared with the equivalent day of the equivalent week of 2019, rolling 7- day average

Source: Springboard and the Department for Business, Energy and Industrial Strategy

Accessibility: This data is proprietary and so not published

Timeliness and relevance

The aggregate CHAPS-based indicator of credit and debit card purchases, rolling 7-day average, n.s.a., February 2020 = 100



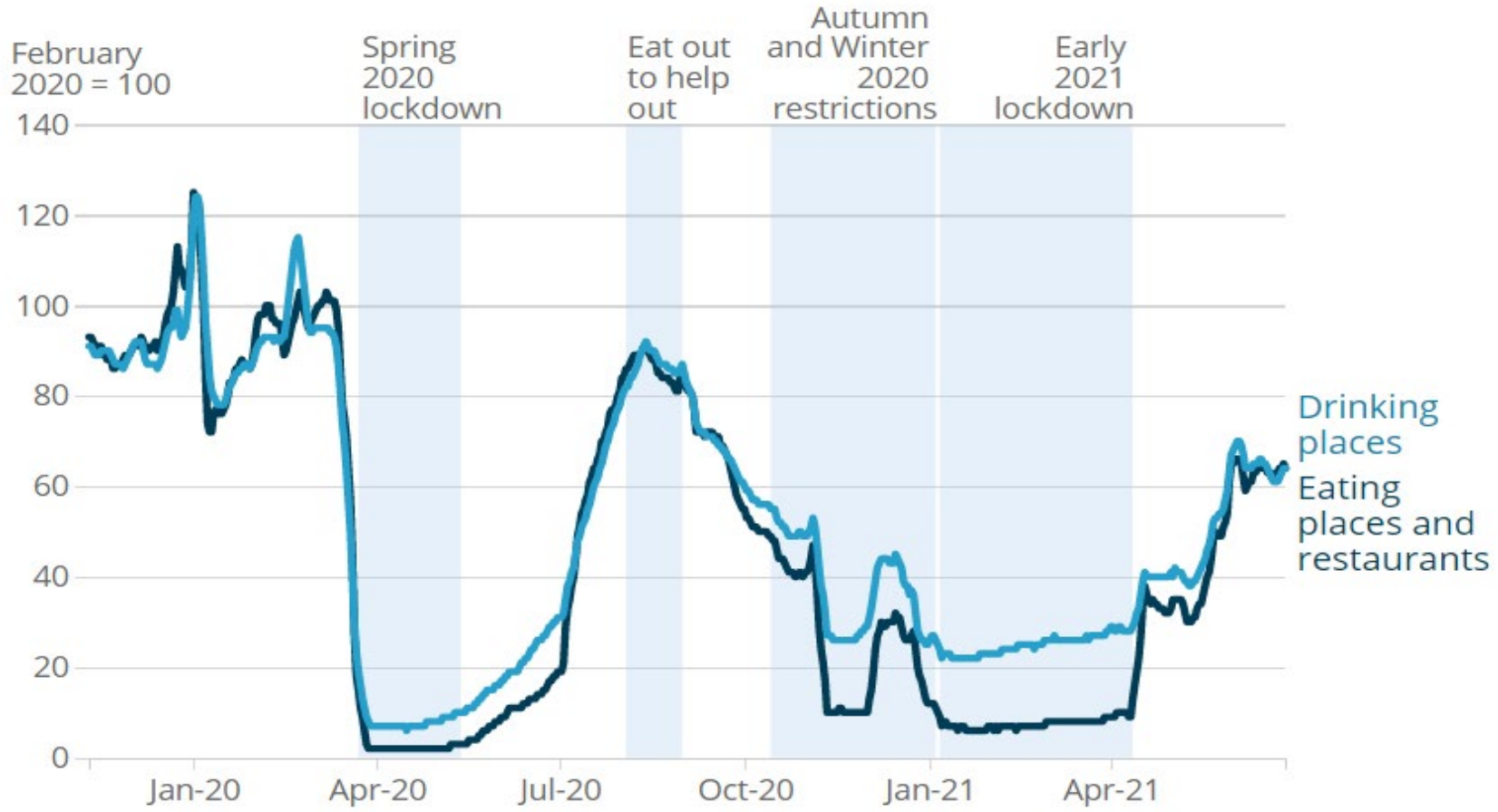
Source: ONS and Bank of England calculations

Coherence and comparability: Other financial institutions payment data is not published, so not easily comparable.

Also, data only available for a short time period

Granularity and richness

Consumer expenditure on hospitality sub-sectors, 7 day average, February 2020 = 100



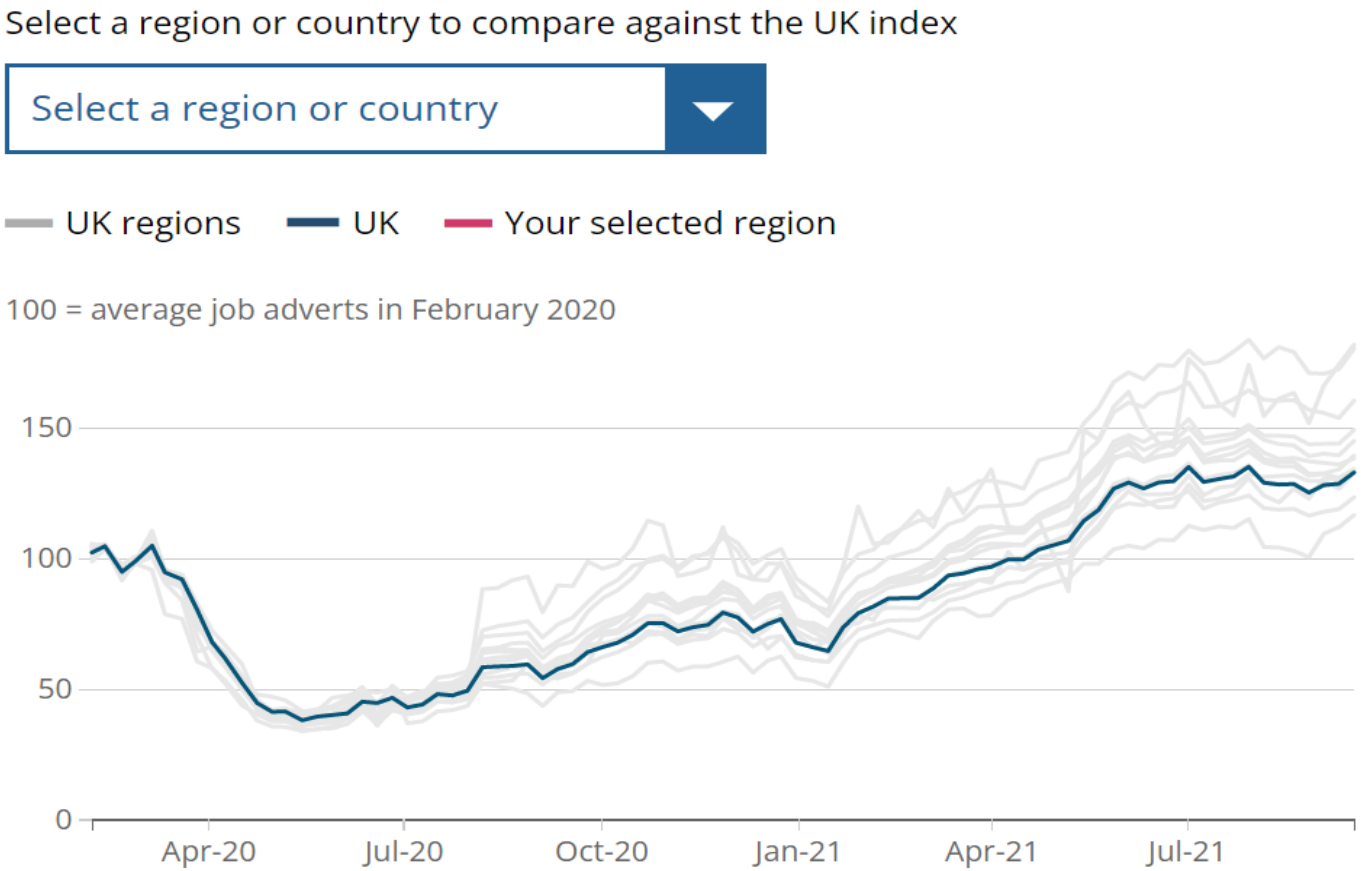
Source: Revolut **Note:** Total (in-store and online) UK consumer spending for Revolut customers

Accessibility: This data is not published

Coherence and comparability: Not easily comparable with other card payment sources

Timeliness, relevance, granularity and richness

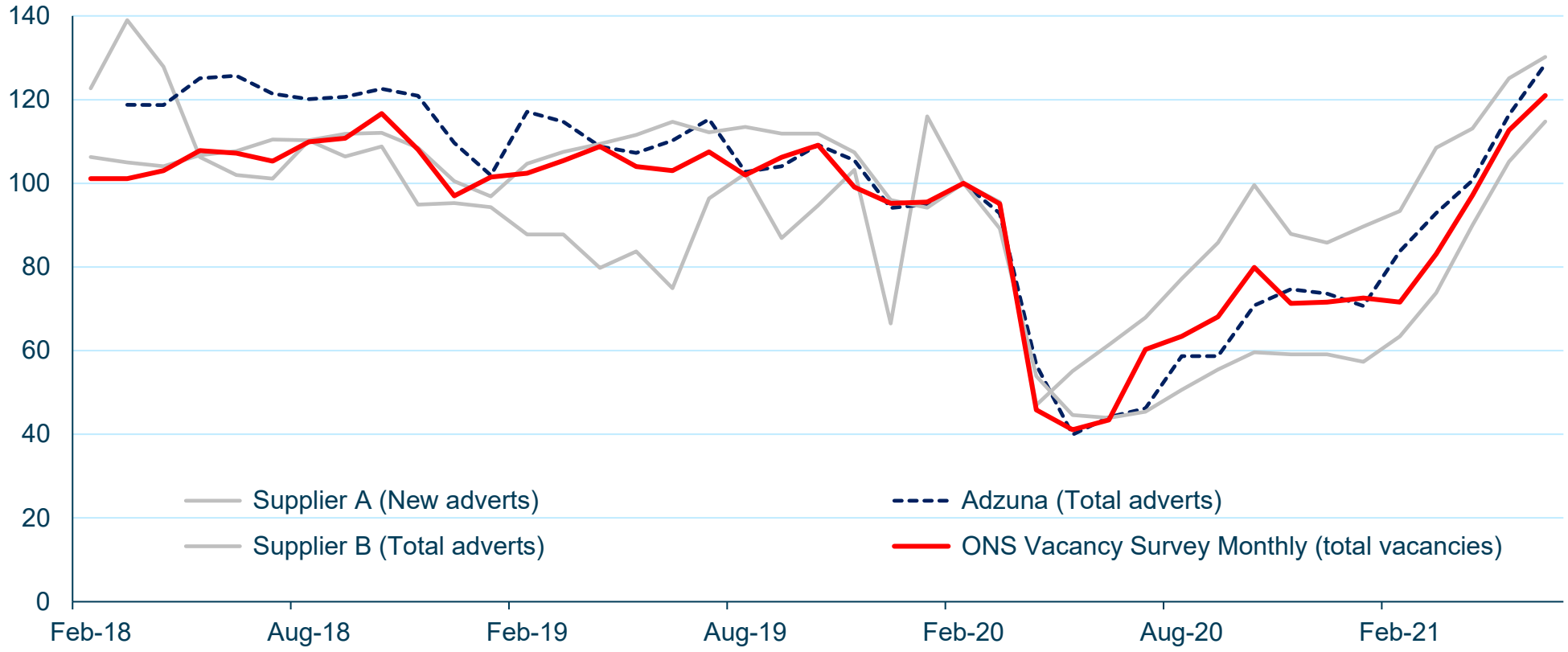
Weekly total online job ads by country and region, Feb 2020 average = 100



Source: Adzuna **Note:** Not seasonally adjusted. Series de-duplicated

Accuracy, reliability and coherence?

Monthly ONS job vacancies, Adzuna online job ads and two other data suppliers



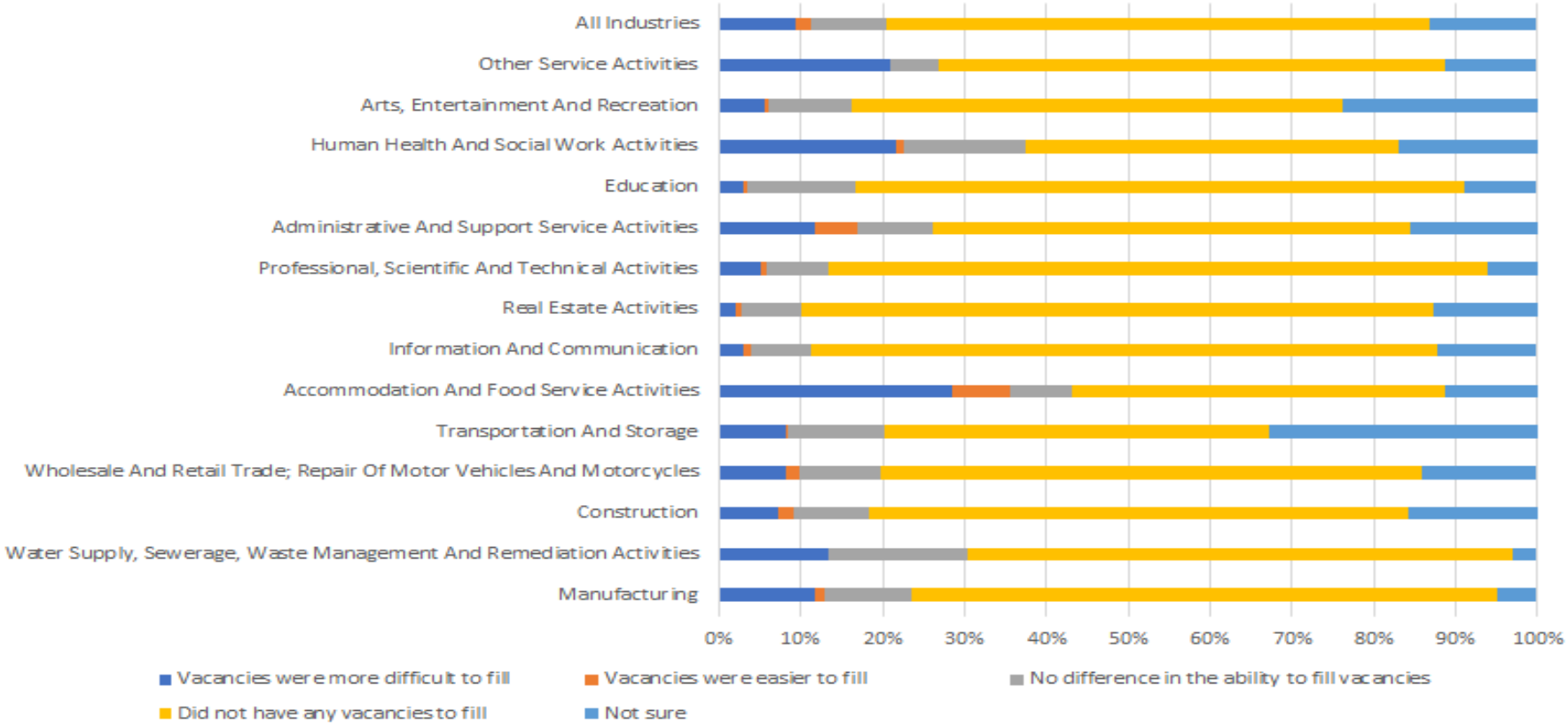
Accuracy and reliability: Some inconsistencies with ONS estimates

Coherence: Data from different suppliers are not always consistent

Source: Adzuna, ONS Vacancy Survey, and two other UK data suppliers **Note:** Not seasonally adjusted

Timeliness, relevance, granularity & coherence

How does your business's ability to fill vacancies in the last month compare with normal expectations for this time of year?



Accuracy and reliability: Uses Business Register sample frame and SIC

Relevance: Questions developed with government departments to address key policy priorities

Source: ONS Business Insights and Conditions Survey (BICS), Wave 36

To paraphrase the well known quote by George E. P. Box (1978):

All real time indicators are wrong, but some are useful

Suggested approach

The problem facing statistical agencies

- A wide range of potential indicators **could** be produced
  - not producing any leaves this space open to commercial ‘big data’ suppliers
- But resources available for research and development, data collection, cleaning and publication are **limited**
  - it is also time consuming securing data sharing agreements from suppliers
- Recognising that not all RTIs are of equal statistical value, a **balanced scorecard** might help to prioritise resources?

An (illustrative) balanced scorecard approach

Dimension	Key questions for real time indicators
Relevance	Do they meet users' needs? Plug significant data gaps?
Timeliness	Frequency? How far ahead of existing statistics?
Accuracy and reliability	How close is it to official statistic estimates? How volatile?
Accessibility	Is the data published? Can the data be linked?
Granularity and richness	Regional, industry, or other breakdowns? Many variables?
Coherence and comparability	How representative is it? Can it be reliably combined? How does it compare between regions, sectors, or over time?

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Coherence and comparability	How representative is it? Can it be reliably combined? How does it compare between regions, sectors, or over time?
Additionality	Does it plug key data gaps? Add value to what's available?
Cost and value for money	How much would it cost to produce or purchase? Is it vfm?
Continuity and longevity	Is continuity of supply assured? Long or short time series?
Nowcasting	Is it suitable for nowcasting, forecasting or leading index?

Next steps

What can National Statistical Institutes do?

- Introduce a monthly GDP series
- Consider new business insights and household surveys
- Develop trusted relationships with key data suppliers
- Establish in-house data science and RTI R&D capability
- Discuss and agree clear criteria for choosing RTIs
- Make the data publicly available wherever possible
- Consider governance, quality assurance, and guidance
- Be clear that RTIs are a **supplement** to official statistics

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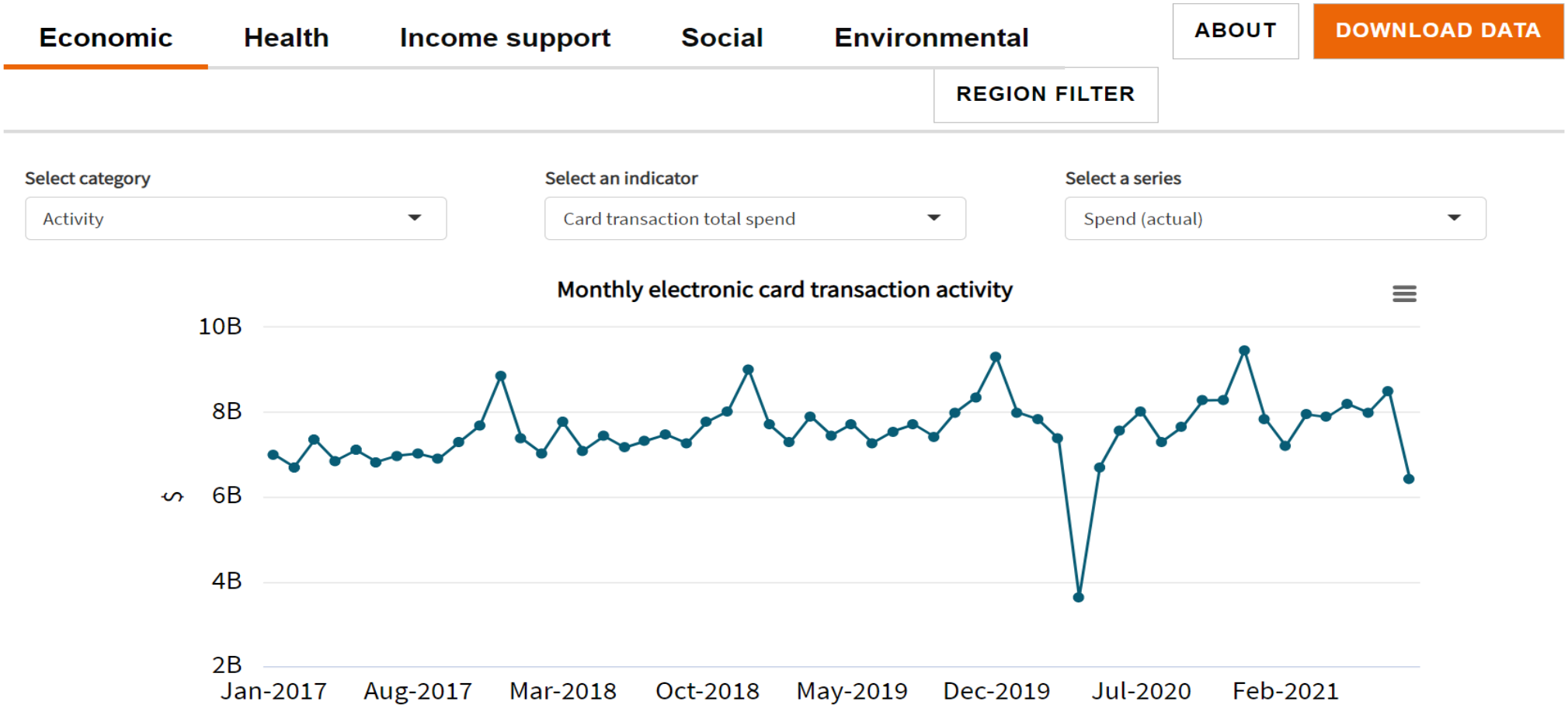
Data platforms improve accessibility



Source: Statistics New Zealand: https://www.stats.govt.nz/experimental/covid-19-data-portal

The ultimate goal – the four quadrants

Official statistics
Accuracy and reliability
Coherence and comparability
Accessibility

Experimental statistics and real time indicators
Relevance Timeliness
Granularity and richness

Data & linked datasets
Accuracy
Granularity and richness
Accessibility

Analysis
Relevance
Coherence
Clarity

Q & A

Annex

Abstract

Real time indicators are not new. Yet the COVID-19 pandemic has seen them play a more central role in informing government policymakers, media and the public than in the past. This reflects the need for timely and granular indicators at a time of crisis, and growing availability of high frequency data. But their emergence has been uneven across countries and has occurred in spite of their challenges and limitations.

This paper discusses the factors driving the growing use of real time indicators, based on the United Kingdom's experience. Their rapid adoption is a response not only to the pandemic but also to the call by Bean (2016) for the modernisation of economic statistics by exploiting private and public sector data sources. New data science methods and tools, such as web scraping and APIs, have also helped drive take-up.

Real time indicators can bolster the evidence base for policymakers. But they can also pose significant challenges, both operational and conceptual, for national statistical institutes. Given the growing array of potential indicators, we outline criteria to help assess their relevance and prioritise resources across the wide array of potential indicators.

Finally, the paper suggests practical steps government statisticians and other analysts can take towards "providing a new tool for empirical macroeconomics" (Chetty, et al, 2020) which meet the needs both of government policymakers and academic researchers.