Outcomes, costs and “valuing” social prescribing

Outline

- What is value?
- What impact does the intervention have on our measured outcomes?
- What are the implications for cost-effectiveness?

Value

- Gross or net:
- For efficiency terms: net
  - The benefits net the costs.
  - Crucial for economic evaluation
  - Crucial for aiding decision makers.
  - Costs – opportunity costs, where money could be spent elsewhere (the next best alternative).
  - Benefits – All benefits? Or simply health benefits?

Objectives

- The impact of the intervention on:
  - Primary health outcome: HbA1c (blood glucose control)
  - Secondary health outcomes: Blood pressure, cholesterol (total), BMI, Smoking status
  - Health care costs and use: In-patient elective and non-elective, Out-patient and A&E
- Cost-effectiveness analysis:
  - Is the intervention a cost-effective method of reducing HbA1c and blood pressure?

Data

- Three sources of data
  - QOF data for eligible patients registered in the treatment and control practices.
    - 40 – 74 with one of a range of conditions (all individual have type-2 diabetes).
  - Data from 1/4/2011 – 31/3/19
  - Health outcomes data, age, sex, ethnicity, presence of additional (intervention eligible) co-morbidities, Index of Multiple Deprivation.

  - Intervention data
    - Linked to QOF data to identify individuals referred to intervention.

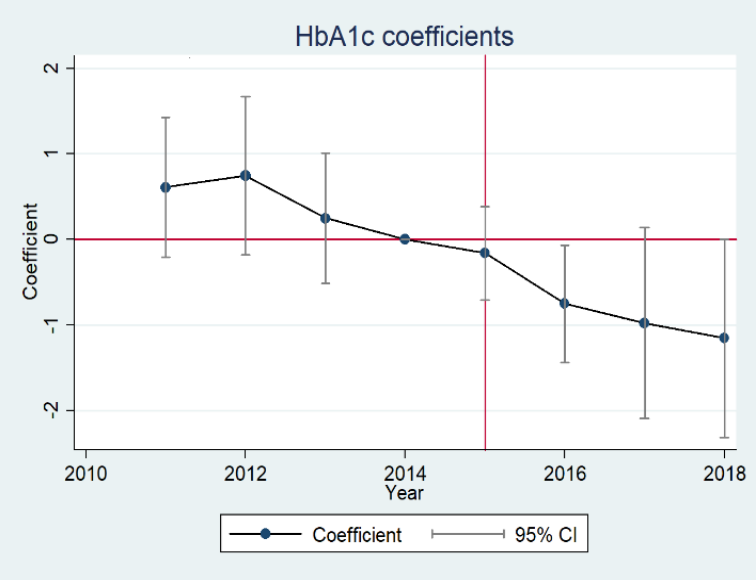
Data

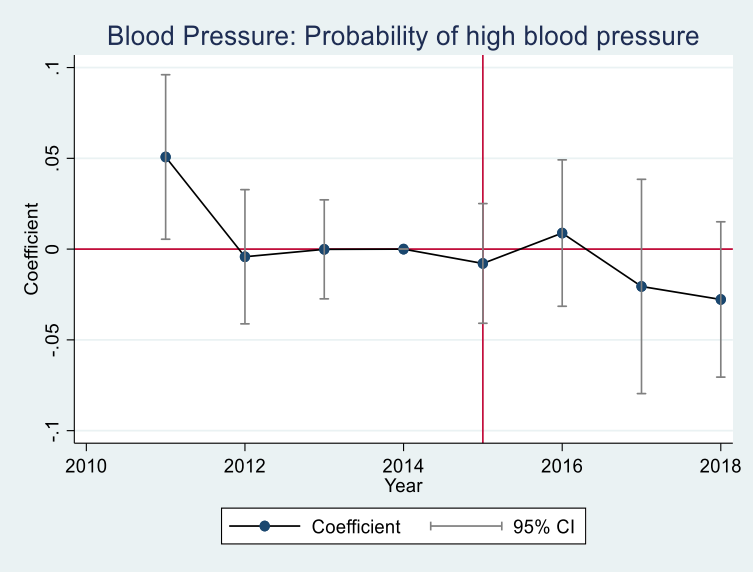
- SUS Data
  - Linked to QOF and intervention data
  - Same individuals – based on same conditions
    - 1/4/2013 – 31/3/2019
  - IP – elective and non-elective, OP, A&E.
    - Use the final tariff for cost of services.
- All data extracted by NECS (North of England Commissioning Support Unit)
- Depending on the exact model
  - ~50,000 observations
  - ~8,300 individuals
  - ~4,800 individuals in treatment practices
  - ~1,400 individuals actually receive treatment

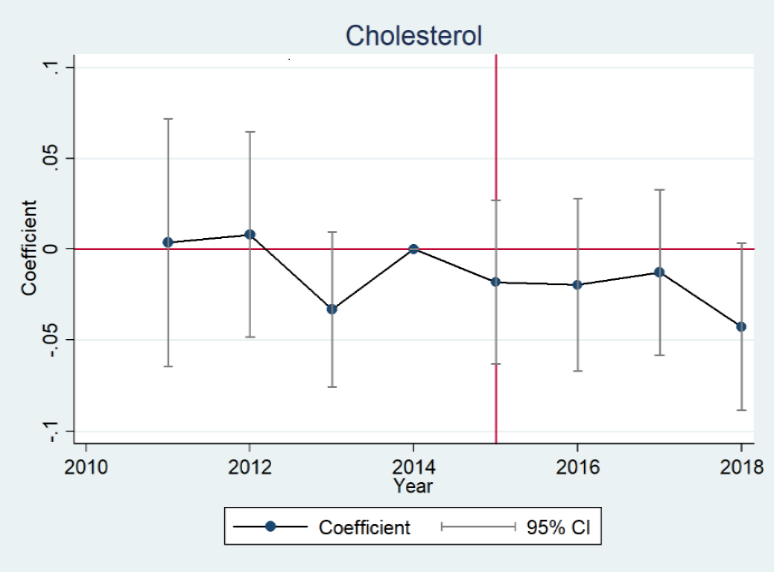
Methods

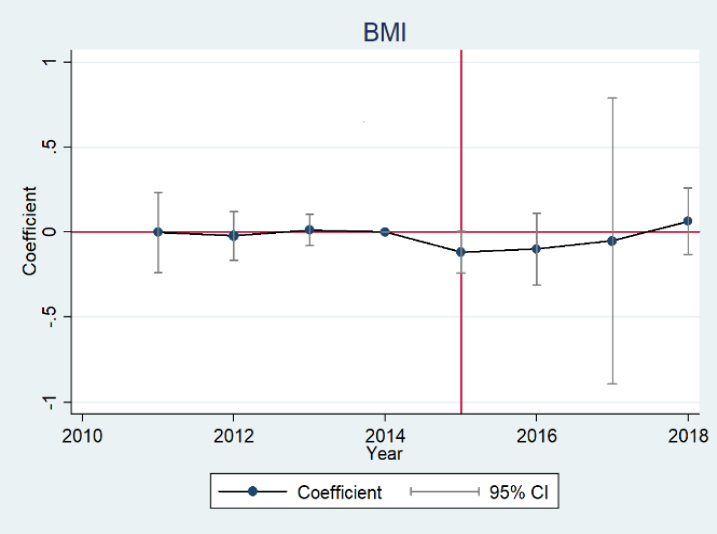
- Difference-in-differences analysis
- Intention-to-treat
  - Overcomes regression to the mean problems
  - Reflects real world nature of treatment

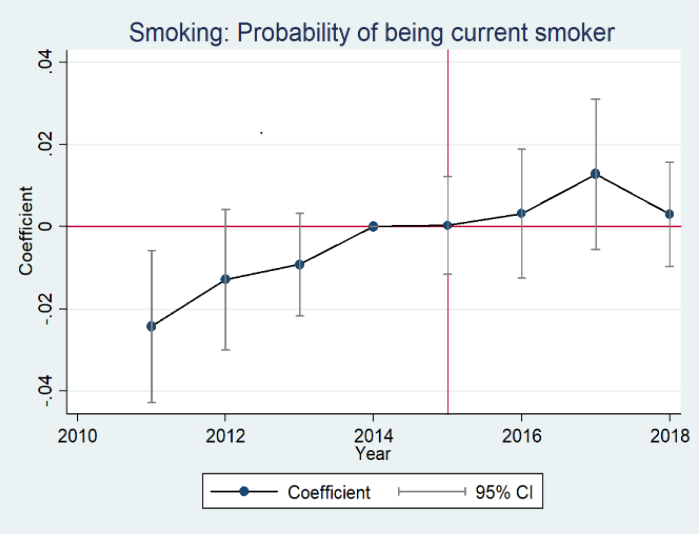
Health outcomes.











Summary of health outcomes 1

- The intervention had a statistically significant impact on HbA1C
  - Not clinically significant
- The impact was increasing over time
- The effect on HbA1c was larger for individuals:
  - living in the most deprived areas
  - with fewer than two additional co-morbidities
  - who are older people
  - who are ethnically white

Summary of health outcomes 2

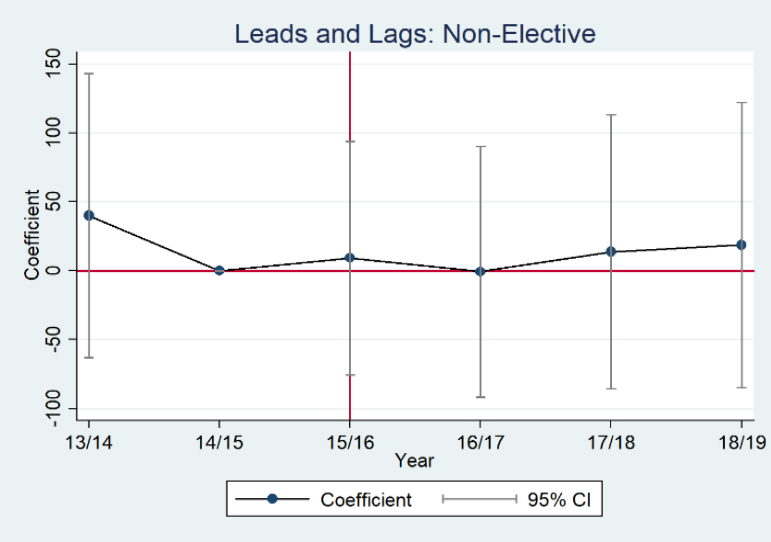
- There was no overall statistically significant reduction in the probability of having high blood pressure.
  - However, there was a significant 5.6% reduction in the probability of having high blood pressure for the ethnically non-white.
  - And a significant 3.5% reduction for younger age-groups.

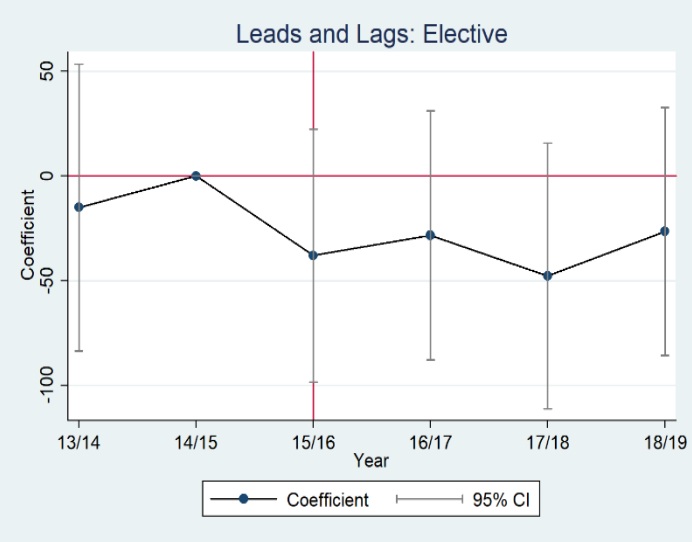
- No estimated effects for the other health outcomes.

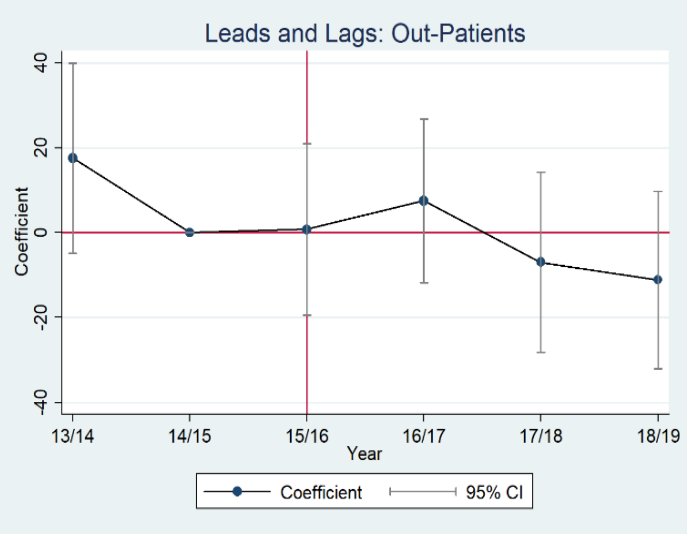
Summary of health outcomes 3

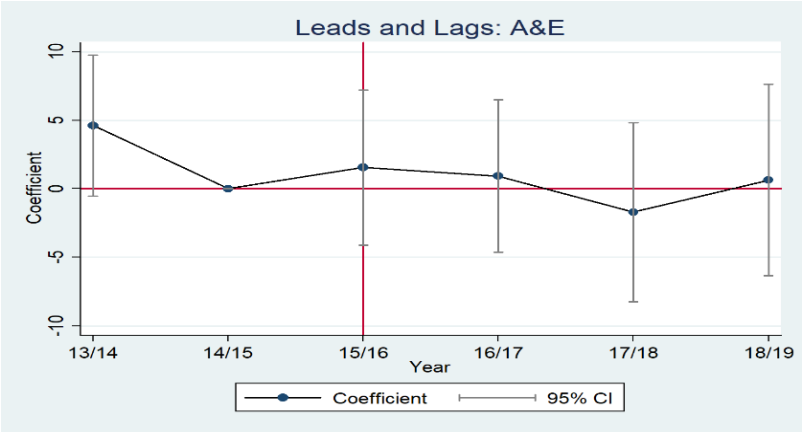
- Moving away from the ITT analysis we find:
  - For HbA1c we find reductions as high as -4.05 mmol/mol (statistically significant) and -7.59 mmol/mol (not statistically significant). Clinically significant changes.
  - For probability of having high blood pressure we find reductions as high as 10% (statistically significant).
  - But these results do depend on the exact specification of the model.

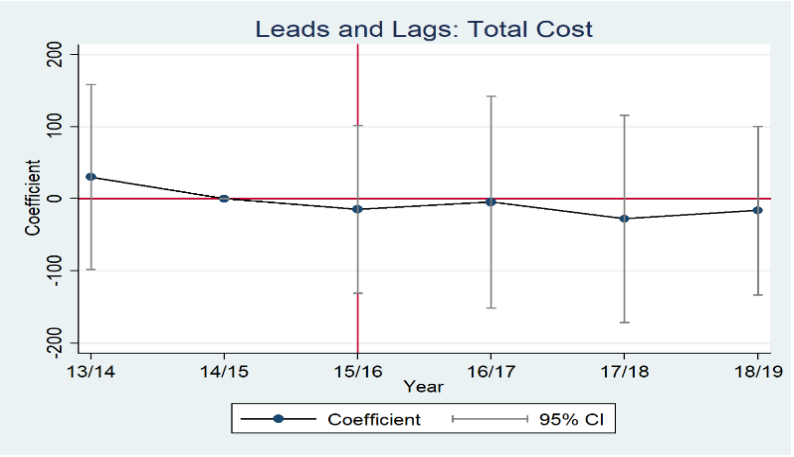
Cost outcomes











Cost outcomes

- Small (and not statistically significant) reductions in expected health care costs for the intention-to-treat analysis.

- Some larger (not statistically significant) estimated reductions for non-elective care for individuals with no additional co-morbidity (in the region of £50 per person, per year).

Cost outcomes

- When moving away from the intention-to-treat analysis, in general, we find larger (not statistically significant) estimated reductions (in the region of £60 per person, per year for non-elective care – an 18% reduction compared to the control group).

- Find evidence that individuals are moving from A&E and non-elective care to elective care/outpatient care.

Is the intervention a cost-effective way of reducing HbA1c and blood pressure?

- Cost-effectiveness analysis on the very narrow benefit of reducing HbA1c and blood pressure – the only measurable outcomes we had available for a cost-effectiveness model of diabetes.

- Use UKPDS-OM2© (Hayes et al., 2013) – well established simulation model for type 2 diabetes.

- The model will analyse a range of outcomes – many of which we had no data for (used population averages): eg. Ischemic heart disease, myocardial infarction, stroke, amputation, blindness, renal failure, ulcer…)
  - Similarly for risk factors, eg high-density and low-density lipoprotein cholesterol, peripheral vascular disease, white blood cell count…

Cost-effectiveness analysis

- Health care provider perspective
- The model simulate future QALYs and potential costs
- Costs of the intervention taken from the intervention provider.
- At the estimated level of effectiveness from the health outcomes models (presented earlier) the intervention was not cost-effective for reducing HbA1c and blood pressure.

Summary

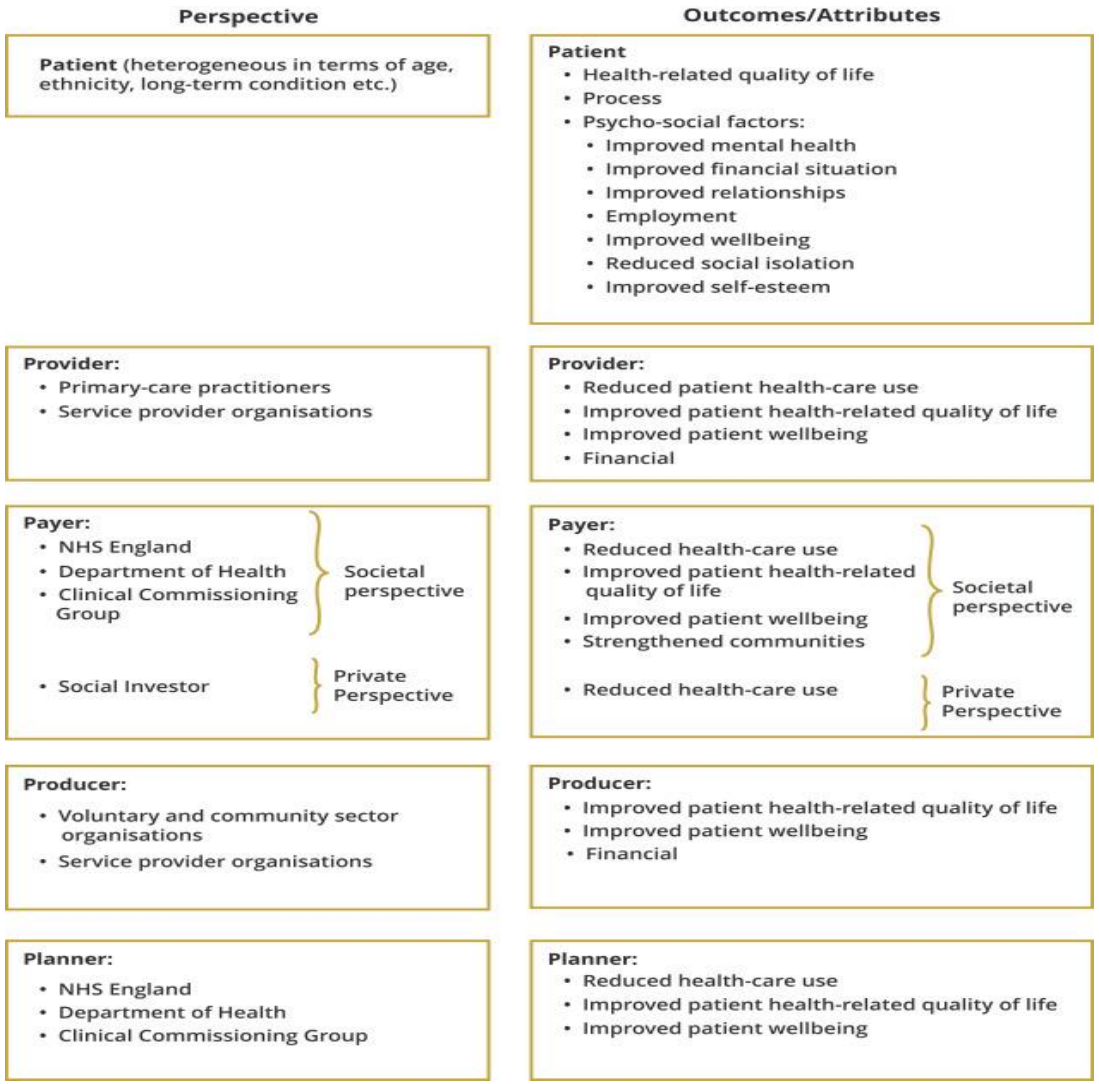
- Complex set of results – mirroring a complex intervention.

- Take-away points
  - That the intervention had a measurable (if small) impact on health outcomes is a very promising and potentially exciting result.
    - Intervention is not targeted at specific clinical outcomes
  - The hospital use and cost outcomes are at times economically, if not statistically, significant.
    - Hospital care is still a relatively rare event, so power an issue
  - As a decision maker you would be reluctant to recommend the intervention as a cost-effective way to reduce HbA1c and blood pressure
    - Does that mean we shouldn't recommend the intervention/social prescribing?

Value

- SP is aimed at the social determinants of health
  - Cost-effectiveness may not be appropriate

- Who is the unit of treatment?
- Whose perspective should we take?
- What are the appropriate outcomes?



Wildman, J and Wildman JM (2019) Combining Health and Outcomes Beyond Health in Complex Evaluations of Complex Interventions: Suggestions for Economic Evaluation *Value in Healthcare*, volume 22, issue 5, P511-517

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