Development of the ScotPHO Deprivation Profiles

Scottish Public Health Observatory

NHS National Services Scotland

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This paper provides information about proposed development of the Scottish Public Health Observatory (ScotPHO) deprivation profiles, summarises feedback from initial stakeholder engagement carried out by the Local Intelligence Support Team (LIST) team and outlines next steps in this development exercise.
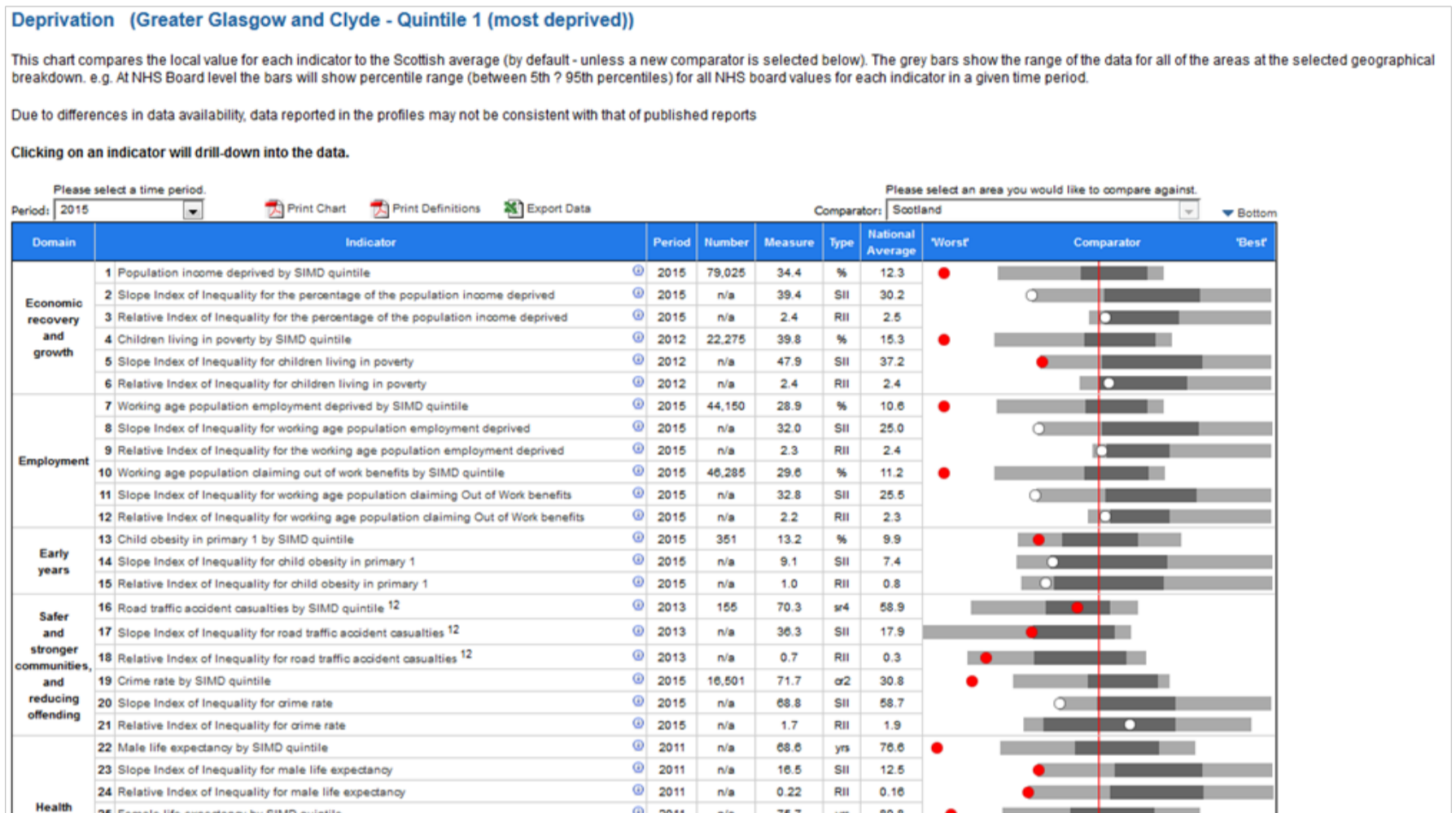
Background

ScotPHO has developed a range of profiles, which are available through its online profiles tool. In relation to the deprivation profiles, users can select a Health Board or Local Authority of interest and can decide which deprivation quintile they wish to focus on: from "Quintile 1 - most deprived" through to "Quintile 5 - least deprived". Users are then presented with a spine chart, highlighting how their chosen area compares to the Scotland average for that deprivation quintile. Users can view the spine chart for different years and, by clicking on the indicator name, they can view more detailed information for individual indicators (such as breakdowns by quintile and trends over time). It is also possible to export the charts and the underlying data.

An example of part of one of these spine charts is shown overleaf. This example shows results for the most and least deprived quintiles in the NHS Greater Glasgow & Clyde area. For each of the indicators listed, the spine chart indicates how this area compares to the Scotland average for the selected deprivation quintile. The red line down the centre of the chart shows the Scotland average and the grey bars show the range of values observed across Scotland. A red dot indicates that the value for the selected area is significantly worse than the Scotland average for this quintile, a blue dot indicates that the value for this area is significantly better than the Scotland average and a white dot indicates that the value for this area is not statistically different from the Scotland level average. The aim is to try to highlight to users how their selected quintile and area compare to the Scottish average for a range of indicators.

The spine charts summarise a lot of complex information and feedback suggests that some users find them difficult to interpret and use in practice. The Information Services Division (ISD), part of Public Health Intelligence within NHS National Services Scotland, therefore recognised a need to further develop the deprivation profiles information. Proposed developments were discussed internally and a prototype, presenting the information in an alternative way, was developed in early 2018. A key part of

this development work will be to gather feedback from stakeholders, to make sure that any new outputs are accessible and usable for local improvement work. The first stage of this engagement was carried out by LIST analysts working in the Borders and Lothians areas in early March 2018. The LIST team has been working with a range of local partners to address health inequalities. Examples of this locally focussed work to address inequalities are provided in a paper prepared by the LIST team (due to be published by the end of April 2018).

Example of current ScotPHO deprivation profile information (1)

Deprivation (Greater Glasgow and Clyde - Quintile 1 (most deprived))

This chart compares the local value for each indicator to the Scottish average (by default - unless a new comparator is selected below). The grey bars show the range of the data for all of the areas at the selected geographical breakdown. e.g. At NHS Board level the bars will show percentile range (between 5th ? 95th percentiles) for all NHS board values for each indicator in a given time period.

Due to differences in data availability, data reported in the profiles may not be consistent with that of published reports

Clicking on an indicator will drill-down into the data.

Please select a time period.   Period: 2015   Print Chart   Print Definitions   Export Data   Please select an area you would like to compare against.   Comparator: Scotland   ▼ Bottom

Domain	Indicator	Period	Number	Measure	Type	National Average	'Worst'	Comparator	'Best'
Economic recovery and growth	1 Population income deprived by SIMD quintile	2015	79,025	34.4	%	12.3			
	2 Slope Index of Inequality for the percentage of the population income deprived	2015	n/a	39.4	SII	30.2			
	3 Relative Index of Inequality for the percentage of the population income deprived	2015	n/a	2.4	RII	2.5			
	4 Children living in poverty by SIMD quintile	2012	22,275	39.8	%	15.3			
	5 Slope Index of Inequality for children living in poverty	2012	n/a	47.9	SII	37.2			
	6 Relative Index of Inequality for children living in poverty	2012	n/a	2.4	RII	2.4			
Employment	7 Working age population employment deprived by SIMD quintile	2015	44,150	28.9	%	10.6			
	8 Slope Index of Inequality for working age population employment deprived	2015	n/a	32.0	SII	25.0			
	9 Relative Index of Inequality for the working age population employment deprived	2015	n/a	2.3	RII	2.4			
	10 Working age population claiming out of work benefits by SIMD quintile	2015	46,285	29.6	%	11.2			
	11 Slope Index of Inequality for working age population claiming Out of Work benefits	2015	n/a	32.8	SII	25.5			
	12 Relative Index of Inequality for working age population claiming Out of Work benefits	2015	n/a	2.2	RII	2.3			
Early years	13 Child obesity in primary 1 by SIMD quintile	2015	351	13.2	%	9.9			
	14 Slope Index of Inequality for child obesity in primary 1	2015	n/a	9.1	SII	7.4			
	15 Relative Index of Inequality for child obesity in primary 1	2015	n/a	1.0	RII	0.8			
Safer and stronger communities, and reducing offending	16 Road traffic accident casualties by SIMD quintile [12]	2013	155	70.3	sr4	58.9			
	17 Slope Index of Inequality for road traffic accident casualties [12]	2013	n/a	36.3	SII	17.9			
	18 Relative Index of Inequality for road traffic accident casualties [12]	2013	n/a	0.7	RII	0.3			
	19 Crime rate by SIMD quintile	2015	16,501	71.7	cr2	30.8			
	20 Slope Index of Inequality for crime rate	2015	n/a	68.8	SII	58.7			
	21 Relative Index of Inequality for crime rate	2015	n/a	1.7	RII	1.9			
Health	22 Male life expectancy by SIMD quintile	2011	n/a	68.6	yrs	76.6			
	23 Slope Index of Inequality for male life expectancy	2011	n/a	16.5	SII	12.5			
	24 Relative Index of Inequality for male life expectancy	2011	n/a	0.22	RII	0.16			
	25 Female life expectancy by SIMD quintile	2011	n/a	75.7	yrs	80.8			

Notes:

12. Three-year average number, and 3-year average annual measure.

Key:

% = percent

cr2 = crude rate per 1,000 population

RII =

SII =

sr4 = age-sex standardised rate per 100,000 population to ESP2013.

yrs = years

Spine Chart Key:

● Statistically significantly 'worse' than National average

○ Statistically not significantly different from National average

● Statistically significantly 'better' than National average

○ Statistically significant difference compared to National average

△ No significance can be calculated

'Worse' Area ◄───── Scotland Average ─────► 'Better' Area

5th Percentile   25th Percentile   75th Percentile   95th Percentile

See the detailed Definitions and Sources table for indicator information and Technical Report for further guidance on interpreting the spine.

Example of current ScotPHO deprivation profile information (2)

Deprivation (Greater Glasgow and Clyde - Quintile 5 (least deprived))

This chart compares the local value for each indicator to the Scottish average (by default - unless a new comparator is selected below). The grey bars show the range of the data for all of the areas at the selected geographical breakdown. e.g. At NHS Board level the bars will show percentile range (between 5th ? 95th percentiles) for all NHS board values for each indicator in a given time period.

Due to differences in data availability, data reported in the profiles may not be consistent with that of published reports

Clicking on an indicator will drill-down into the data.

Please select a time period.   Print Chart   Print Definitions   Export Data   Please select an area you would like to compare against.

Period: 2015   Comparator: Scotland   ▼ Bottom

Domain		Indicator		Period	Number	Measure	Type	National Average	'Worst'	Comparator	'Best'
Economic recovery and growth	1	Population income deprived by SIMD quintile		2015	7,110	3.1	%	12.3			
	2	Slope Index of Inequality for the percentage of the population income deprived		2015	n/a	39.4	SII	30.2			
	3	Relative Index of Inequality for the percentage of the population income deprived		2015	n/a	2.4	RII	2.5			
	4	Children living in poverty by SIMD quintile		2012	1,615	3.2	%	15.3			
	5	Slope Index of Inequality for children living in poverty		2012	n/a	47.9	SII	37.2			
	6	Relative Index of Inequality for children living in poverty		2012	n/a	2.4	RII	2.4			
Employment	7	Working age population employment deprived by SIMD quintile		2015	4,655	3.1	%	10.6			
	8	Slope Index of Inequality for working age population employment deprived		2015	n/a	32.0	SII	25.0			
	9	Relative Index of Inequality for the working age population employment deprived		2015	n/a	2.3	RII	2.4			
	10	Working age population claiming out of work benefits by SIMD quintile		2015	5,195	3.6	%	11.2			
	11	Slope Index of Inequality for working age population claiming Out of Work benefits		2015	n/a	32.8	SII	25.5			
	12	Relative Index of Inequality for working age population claiming Out of Work benefits		2015	n/a	2.2	RII	2.3			
Early years	13	Child obesity in primary 1 by SIMD quintile		2015	120	6.2	%	9.9			
	14	Slope Index of Inequality for child obesity in primary 1		2015	n/a	9.1	SII	7.4			
	15	Relative Index of Inequality for child obesity in primary 1		2015	n/a	1.0	RII	0.8			
Safer and stronger communities, and reducing offending	16	Road traffic accident casualties by SIMD quintile [12]		2013	90	39.7	sr4	58.9			
	17	Slope Index of Inequality for road traffic accident casualties [12]		2013	n/a	36.3	SII	17.9			
	18	Relative Index of Inequality for road traffic accident casualties [12]		2013	n/a	0.7	RII	0.3			
	19	Crime rate by SIMD quintile		2015	2,697	11.7	cr2	30.8			
	20	Slope Index of Inequality for crime rate		2015	n/a	68.8	SII	58.7			
	21	Relative Index of Inequality for crime rate		2015	n/a	1.7	RII	1.9			
Health	22	Male life expectancy by SIMD quintile		2011	n/a	82.1	yrs	76.6			
	23	Slope Index of Inequality for male life expectancy		2011	n/a	16.5	SII	12.5			
	24	Relative Index of Inequality for male life expectancy		2011	n/a	0.22	RII	0.16			
	25	Female life expectancy by SIMD quintile		2011	n/a	84.8	yrs	80.8			

Development Work

ISD developed a prototype presentation of deprivation profile information in early 2018[1]. This is intended to take users through the information step-by-step, giving them the opportunity to interact with the data, in order to improve their understanding and aid interpretation and to highlight the impacts of deprivation inequalities in their chosen area.

Users are first prompted to select an area and an indicator. The prototype is currently set up to display only information relating to all cause mortality at Scotland level and for the areas covered by NHS Borders and NHS Lothian. The final version will hold data on a range of different indicators for geographical areas across Scotland.

Note also that the year labels in the prototype relate to the mid point of a three year average (for example: data labelled "2010" is the three year average for the period 2009-2011).

On the next sheet, the user can view information about variations by deprivation quintile over time. The chart on the left is intended to give a visual summary of the differences between quintiles in the selected year. The chart on the right summarises how this is changing over time.

The trend chart defaults to showing only the most and least deprived quintiles to more clearly show the pattern over time. This is mainly to aid interpretation in smaller geographical areas, where the variation over time at quintile level may not follow a clear or consistent pattern. The user can opt to see trends for the middle quintiles as well, using the drop down menu.
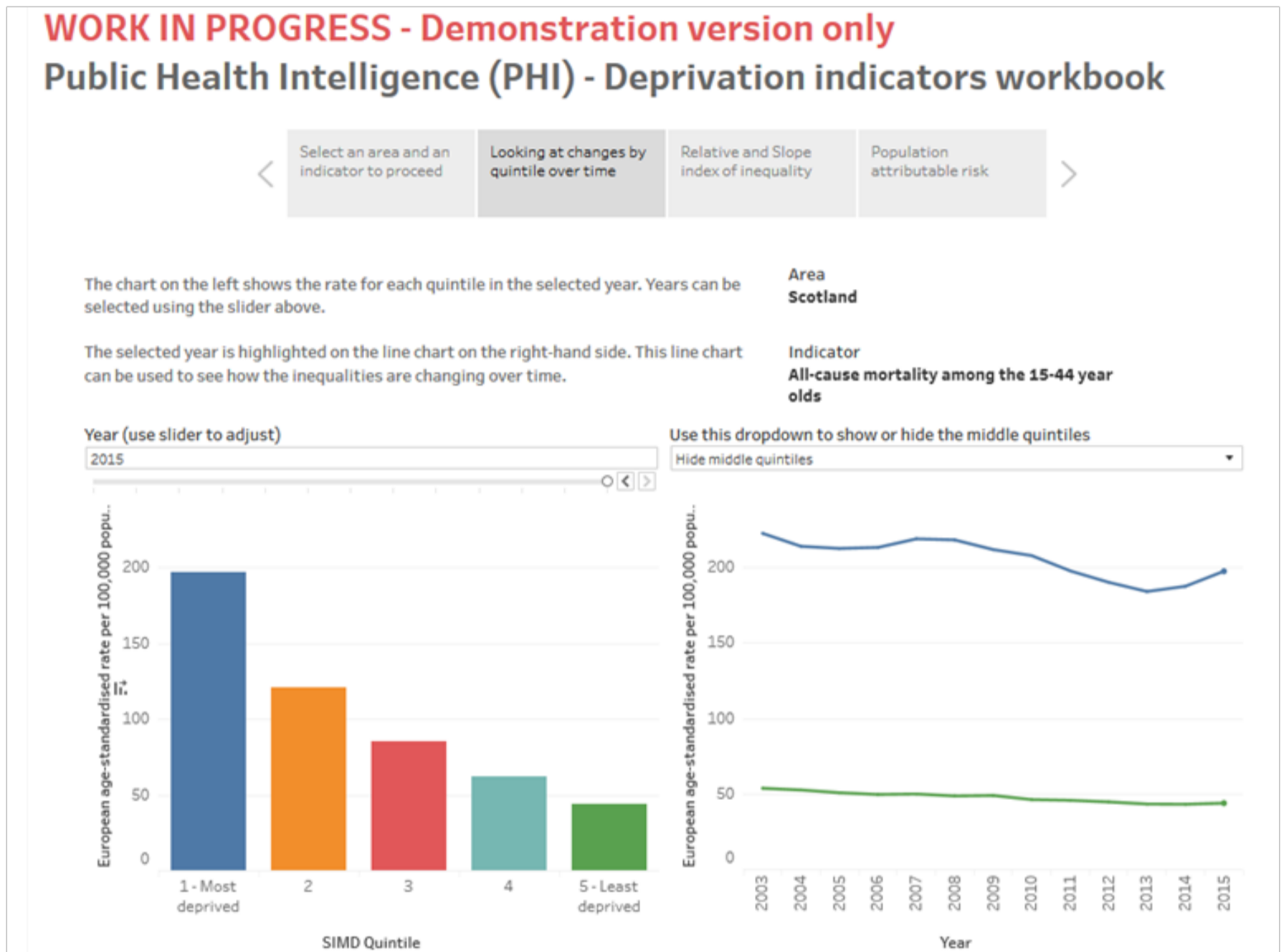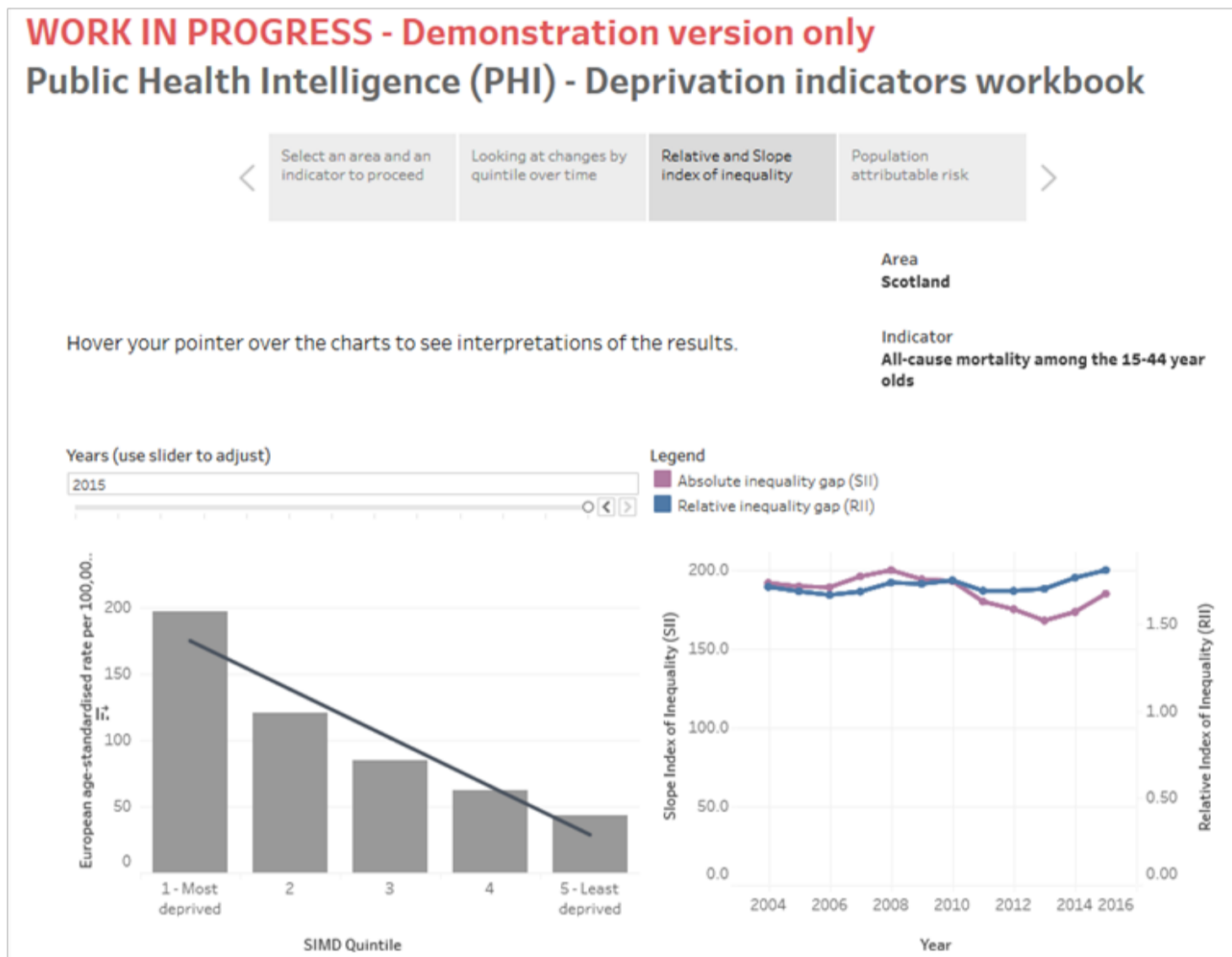

When a user hovers over a bar or a point on the line of a chart, an information box appears. This contains the indicator name, geographical level, year and value; for example:

Next, the user can view information about the slope index of inequality (SII) and the relative index of inequality (RII). The SII is the absolute difference between the least and most deprived, using a method that takes into account the trend over all five quintiles. The RII is the SII divided by the mean value for all five groups, reflecting the relative position of the most deprived compared to the least deprived. In an ideal world, both the SII and RII would be zero. These are measures that people less familiar with inequalities data may find difficult to interpret.

The chart on the right hand side shows the trend over time for the SII and RII. The chart on the left hand side is presented to show how the slope has been derived from the underlying data.

When a user hovers over a point on the line chart, an information box appears. This contains text explaining what the measure is and how this relates to the data of interest, for example:
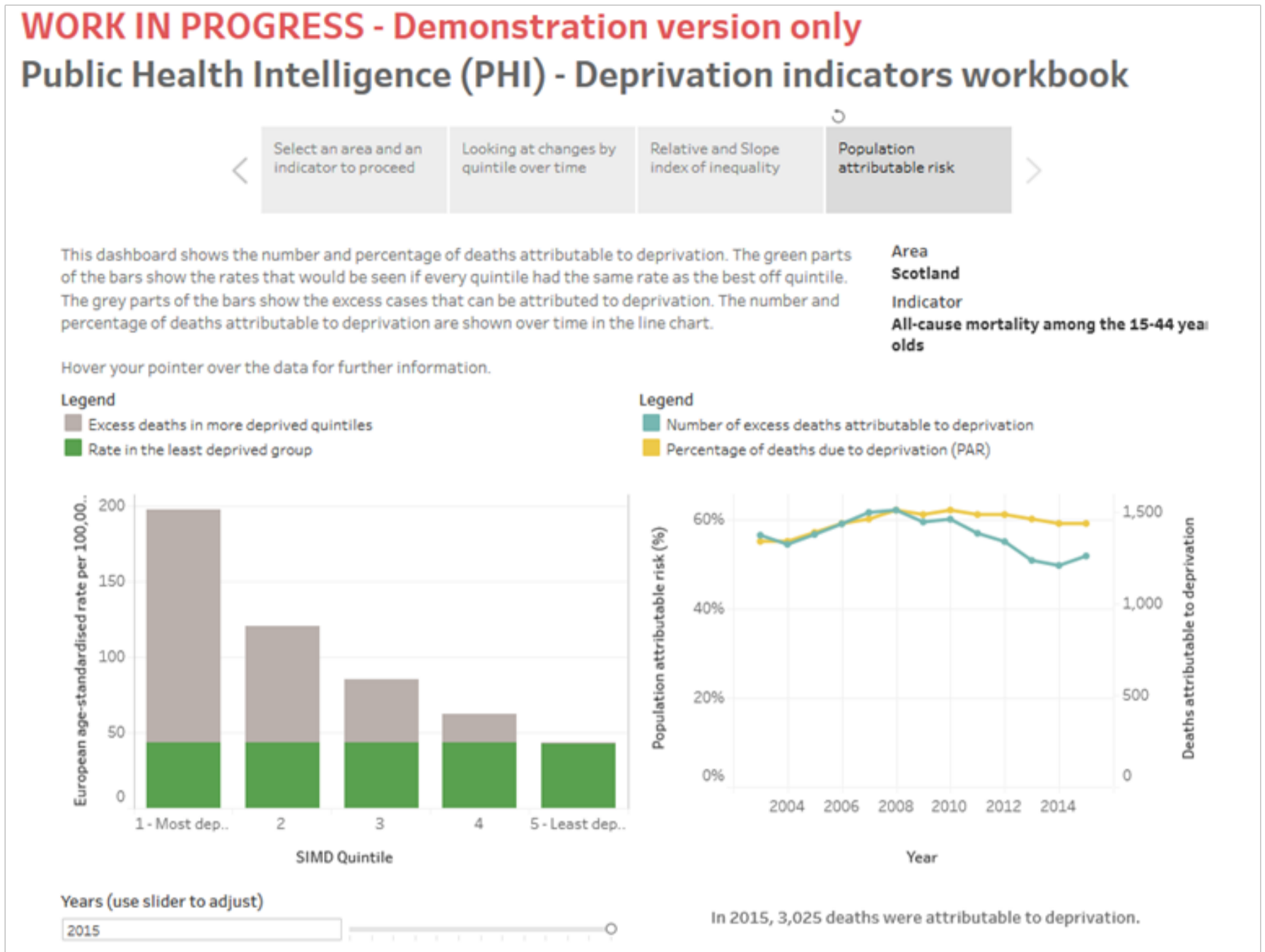
Scotland - 2015
All-cause mortality among the 15-44 year olds

The SII value for 2015 is 185.2. This means that the absolute gap between the best and the worst off is 185.2 deaths per 100,000 population. Ideally the SII should be zero.

Scotland - 2015
All-cause mortality among the 15-44 year olds

The RII value for 2015 is 1.81. This reflects the relative position of the worst off compared with the best off and means that the gap between worst and best is 181% of the average value. Ideally the RII should be zero.

Finally, the user can view information about the impact of health inequalities in their area.

WORK IN PROGRESS - Demonstration version only
Public Health Intelligence (PHI) - Deprivation indicators workbook

Select an area and an indicator to proceed	Looking at changes by quintile over time	Relative and Slope index of inequality	Population attributable risk

This dashboard shows the number and percentage of deaths attributable to deprivation. The green parts of the bars show the rates that would be seen if every quintile had the same rate as the best off quintile. The grey parts of the bars show the excess cases that can be attributed to deprivation. The number and percentage of deaths attributable to deprivation are shown over time in the line chart.

Area
Scotland

Indicator
All-cause mortality among the 15-44 year olds

Hover your pointer over the data for further information.

Legend
■ Excess deaths in more deprived quintiles
■ Rate in the least deprived group

Legend
■ Number of excess deaths attributable to deprivation
■ Percentage of deaths due to deprivation (PAR)

Years (use slider to adjust)
2015

In 2015, 3,025 deaths were attributable to deprivation.

The chart on the left hand side highlights the difference between the rate in the least deprived area and the rate in each of the other quintiles. In the example above, the sections of the bars shaded grey show "excess deaths", which would not have occurred if all quintiles had a death rate equivalent to that observed in the least deprived area.

The chart on the right hand side shows the trend in the number of excess deaths and the trend in excess deaths as a proportion of all deaths. When a user hovers over a point on the line chart, an information box appears. This contains text explaining what the measure is, for example:

Scotland - 2015
All-cause mortality among the 15-44 year olds

In 2015 the effects of deprivation accounted for 1,257 (59%) of the deaths in those aged 15 to 44 years in Scotland.

Initial Stakeholder Feedback

Initial engagement was carried out by LIST analysts in the Borders and Lothians areas in early March 2018. The team demonstrated the prototype and then used a semi structured set of questions about its content and functionality to seek feedback. A summary of the feedback received is presented below.

General content and functionality:

- Helpful development in combination with the existing deprivation profiles tool.
- Users less familiar with data or inequalities measurement found the charts the most useful.
- Users who routinely use inequalities data would like to be able to see the data in tables as well as displayed on charts.
- Option to easily export a chart needed, for example to use in a quick presentation.
- Option to easily export underlying data needed, for example so that charts could be recreated in a house style.
- The ability to compare with Scotland level and with other geographical areas within the tool would be good; there is always a need for this sort of information.
- Some terminology is unclear for users less familiar with inequalities data (see specific examples and comments about labelling below).
- Comparisons need to be clearly explained and labelled, for example being very clear about whether the quintiles being used are defined at national level or at the local area level that has been selected.

Changes in quintile over time sheet:

- Bar chart clear and fairly easy to understand; would be nice to use a slider bar to see the change over time occurring.
- Liked the ability to be able to hide the middle quintiles on the trend chart.
- Needs more labelling and explanation of terminology, for example to explain what the term "quintile" means for those less familiar with inequalities data.
- Interested to see the absolute gap between the most and least deprived presented as well (but note that this may mask what is happening in the middle quintiles).

Relative and slope index of inequality sheet:

- Needs a short plain English definition of both SII and RII upfront on the sheet.
- Perhaps clearer to show the SII and RII on different graphs, or to use a drop down to allow users to choose which measure they want to view.
- SII will be sufficient for most users and some will find RII confusing; perhaps better to focus on SII with the option to look at RII there as well but not the first thing you see.

Population Attributable Risk sheet:

- Potentially very useful information, but not immediately easy to understand or interpret.
- More prominent wording needed to explain what the measures and charts mean.
- Some plain English descriptions to demonstrate what the numbers mean would be beneficial.

Participants were also asked for feedback about who needs to use the data in their organisation, how they would like to use deprivation information, what would be helpful to them to achieve this and which indicators they are most interested in.

Potential users of the data

- Public policy makers.
- Public health colleagues.
- Community planning partners.
- Health & Social Care Partnerships.
- Community and locality planning partners.
- Community capacity teams.
- All those involved in planning and performance management in community planning.
- Local communities seeking to set up locality plans.
- Third sector organisations.

How the data are (or could be) used

- To get a better understanding of local communities.
- To justify service development (or service reduction).
- To change service direction.
- To assess impacts on inequalities (over a longer period).
- To assess service or initiative impact.
- To help with funding bids.
- To assist in community engagement/community dialogue.

Future development of deprivation data

- Data available at a small area level (for example, datazone) that can then be built up into different organisational levels as required (for example, school catchments, GP catchments, community council areas, council wards).
- More timely data; hard to build a case with data that are already several years old.
- Would ideally like to be able to see comparisons for locally defined quintiles as well as nationally defined quintiles; if had to choose between the two, would choose nationally defined quintiles.

Indicators of interest

- Desire to see developed profiles for all of the indicators covered by the existing ScotPHO deprivation profiles, that is:
  › Population income deprived.
  › Children living in poverty.
  › Working age population employment deprived.
  › Working age population claiming out of work benefits.
  › Child obesity in primary 1.
  › Road traffic accident casualties.
  › Crime rate.
  › Male life expectancy.
  › Female life expectancy.
  › All-cause mortality among 15-44 year olds.
  › Patients (age 65+) with multiple emergency hospitalisations.
  › Patients (all ages) with emergency hospitalisations.

- Desire to have more information about other indicators, for example:

  › Educational attainment (number/rate of highers passes, tariff scores, rates of pupils with special educational needs, qualification levels in the adult population, school leaver destinations).

  › Income inequalities (HMRC data; particularly useful if this could be real time)

  › Incidence/prevalence of particular health conditions (such as type 2 diabetes and pre-diabetes).

  › Prescribing rates (particularly for key conditions such as mental health prescribing).

  › Health related behaviours (such as breastfeeding rates, rates of smoking in pregnancy).

  › Indicators relating to poverty, benefits and homelessness (such as food bank usage, rates of benefit sanctions, homelessness rates, pensioners in poverty, rates of single parents in workless households, rates of in work benefits).

  › Adult disability rates.

  › Waiting times for hospital outpatient appointments.

  › Useful if ScotPHO could acknowledge which parts of the overall picture it can cover, recognising that the nationally derived data it produces should be complemented with local assets and insights.

Next Steps

During early summer 2018, ISD will seek to engage with a wider range of stakeholders to steer further development of the deprivation profiles information. This will be done via the LIST team and via colleagues in Health Scotland. The aim is to release developed deprivation profile information later in 2018. After this, engagement with stakeholders will continue and their feedback will be used to maintain and develop the information on an ongoing basis.

Parallel to this, ScotPHO is also developing its online profile tool, to improve accessibility and functionality to all of its profile information.

If you have any questions or would like to provide your own feedback, please contact the ScotPHO team: scotpho@nhs.net.