UNIVERSITY OF ABERDEEN

Data Visualisation: Styles guide & Impact

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In this section...

AIM: Be aware of different styles of data visualisation

- Graphs and tables
- Infographic
- Complex data representations
- Images and narratives

Graphs and Tables

Simple graphs and tables are where we often start (and end) in our data representation. In academia, it was very common that this was the extent of our visualisation output and aimed at a technical and specialist audience.

Now, with a much greater focus on getting impact beyond academia for our research, we are looking for better tools to communicate our findings and tell our stories to a broad audience.

Graphs and Tables

A well thought out table and/or graph can convey a lot of information and, if carefully constructed, can convey information effectively to a broad audience

Think: Audience

- *How long will they give me attention for?*
- *How much effort will they make to understand the message themselves?*
- *Will they be skilled readers of graphs and tables?*
- *Does my graph or table stand alone to tell the story?*

Table 3.
Ten-Year Mortality Conditional on Surviving the First Year

	No.	Age- & Sex-Adjusted HR (95% CI)	Fully adjusted HR[a] (95% CI)
eGFR ≥ 60, no AKI	7,741	1.00 (reference)	1.00 (reference)
eGFR ≥ 60, AKI	1,325	1.74 (1.60-1.89)	1.44 (1.31-1.58)
AKI vs no AKI for eGFR ≥ 60 group		**1.74 (1.60-1.89)**	**1.44 (1.31-1.58)**
eGFR 45-59, no AKI	3,243	1.11 (1.04-1.19)	1.09 (1.02-1.17)
eGFR 45-59, AKI	350	1.77 (1.56-2.02)	1.36 (1.19-1.56)
AKI vs no AKI for eGFR 45-59 group		**1.59 (1.40-1.81)**	**1.25 (1.09-1.43)**
eGFR 30-44, no AKI	1,337	1.48 (1.36-1.61)	1.40 (1.29-1.52)
eGFR 30-44, AKI	219	2.16 (1.85-2.52)	1.69 (1.66-2.11)
AKI vs no AKI for eGFR 30-44 group		**1.49 (1.25-1.70)**	**1.21 (1.03-1.42)**
eGFR < 30, no AKI	425	2.08 (1.85-2.34)	1.87 (1.66-2.11)
eGFR < 30, AKI	121	2.28 (1.85-2.81)	2.02 (1.62-2.50)
AKI vs no AKI for eGFR < 30 group		**1.10 (0.87-1.38)**	**1.08 (0.85-1.36)**

Note: Multivariable Cox regression with interaction terms between AKI and baseline eGFR. Adjusted HRs are reported with reference to no AKI and normal baseline kidney function and for baseline eGFR groups calculated using the interaction terms. eGFRs expressed in mL/min/1.73 m^2. Boldface indicates AKI vs no AKI within each eGFR group calculated using the interaction terms.

Abbreviations: AKI, acute kidney injury; CI, confidence interval; eGFR, estimated glomerular filtration rate; HR, hazard ratio.

a Adjusted for age, sex, Charlson comorbid conditions, hospital admission circumstances, *International Classification of Diseases, Tenth Revision* categories for acute hospital admission diagnoses, and with interaction terms between AKI and baseline eGFR.

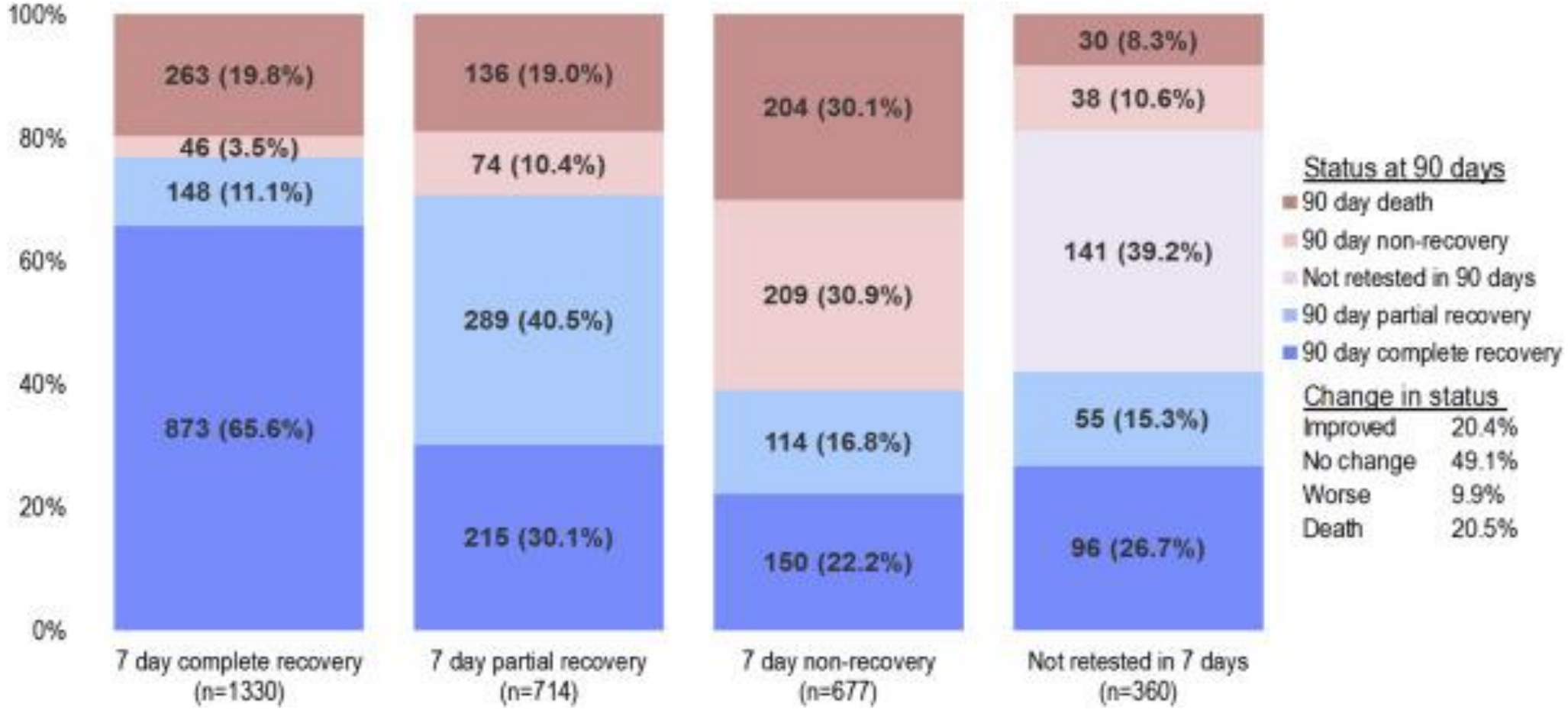
Table options

Simon Sawhney, Angharad Marks, Nick Fluck, Adeera Levin, Gordon Prescott, Corri Black

Intermediate and Long-term Outcomes of Survivors of Acute Kidney Injury Episodes: A Large Population-Based Cohort Study

American Journal of Kidney Diseases, Volume 69, Issue 1, 2017, 18–28

http://dx.doi.org/10.1053/j.ajkd.2016.05.018



Supplementary Figure S2. Comparison of recovery-of-kidney-function status at 7 and 90 days.

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Using a simplified graph to convey comparisons/position in a league

Audience: Policy makers

Time: reviewing large amount of data quickly

FIGURE 2.3 Employment

lowest rate of unemployment in 2010

6% unemployment (national average 12%)

[ScotPHO health profiles 2014 – data from 2010]

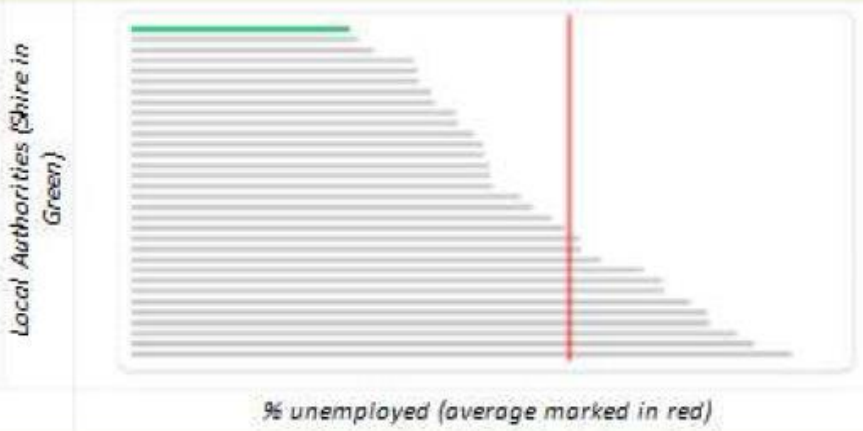


FIGURE 2.4 Education, Skills, and Training

11% of adults have 'low or no qualifications' (national average 15%)

[ScotPHO health profiles 2014 – data from 2010]

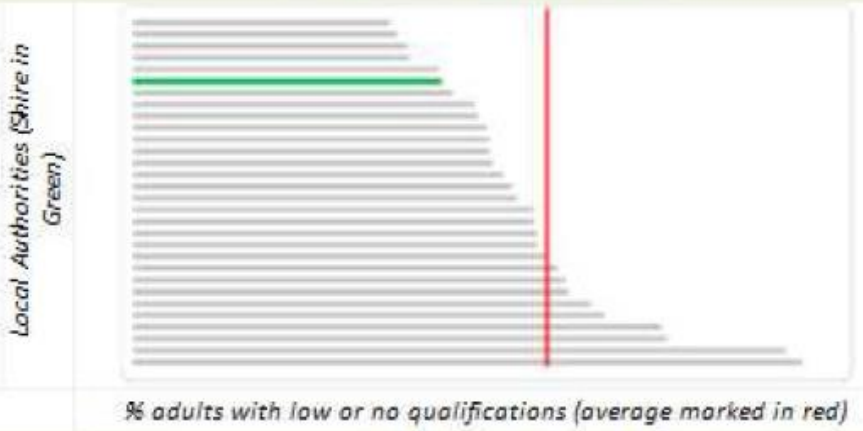
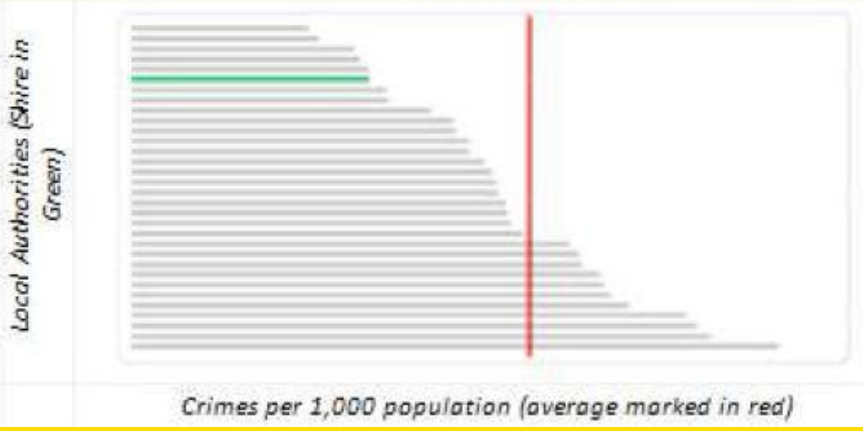


FIGURE 2.5 Crime

24 recorded crimes per 1,000 population (national average 41 per 1,000)

[ScotPHO health profiles 2014 – data from 2010/11]



Infographics

- While technically referring to any data visualisation it is widely used to describe a particular type of story telling with data
- It aims to transfer a lot of data quickly and to enable the reader to follow the clear story
- Sometimes the temptation can be to include a huge amount of information and the flow of how to ‘read’ the graphic gets lost

Audience – often policy and public

Time – need to be engaged and interested as the reader has to ‘work’ a little to follow the story

- http://www.bmj.com/content/356/bmj.j41

SOCIAL DETERMINANTS OF HEALTH

The social determinants of health are the conditions in which we are born, we grow and age, and in which we live and work. The factors below impact on our health and wellbeing.

Childhood experiences

Housing

Education

Social support

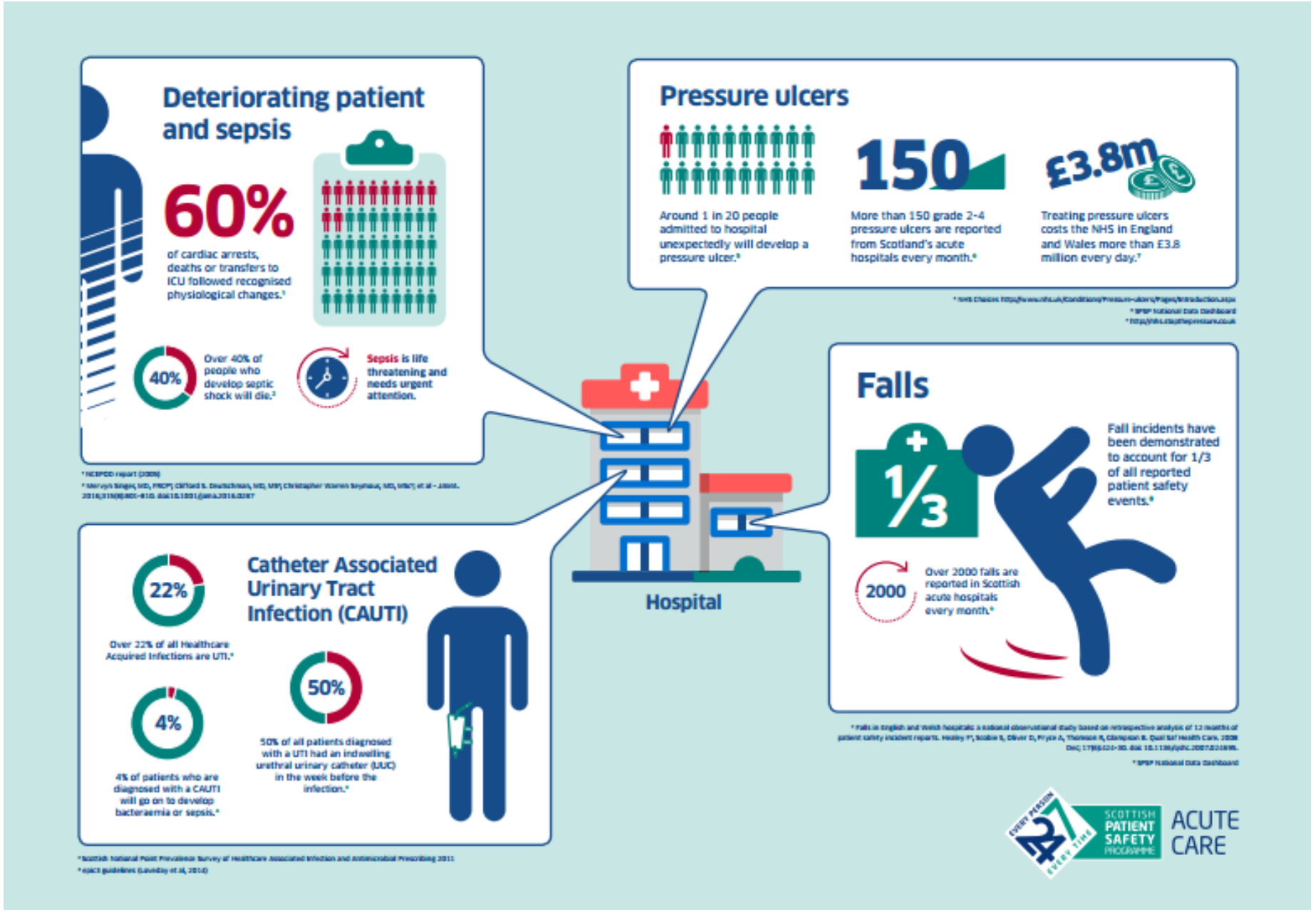
Family income

Employment

Our communities

Access to health services

Source: NHS Health Scotland



http://www.scottishpatientsafetyprogramme.scot.nhs.uk/Media/Docs/Acute%20Adult%20Care/201701_SPSP_AA_Infographic_v1.1.pdf

Complex data representations

Maps are perhaps the most obvious complex data visualisation – made up of thousands of data items but generated into a limited number of graphical representations that many of us can interpret for ourselves (some better than others!).

Basic maps are for the reader to immerse themselves within

Some maps have been processed for us to help ‘tell the story’

Mapping tools – GPS capturing location and movement; Geographic information system (GIS) software enabling the use of geographical data

Learn more

Tutorial in GIS - https://www.ordnancesurvey.co.uk/support/understanding-gis/

GIS in research - http://ubdc.ac.uk/

Complex data representation

- http://www.informationisbeautifulawards.com/news/188-2016-the-winners

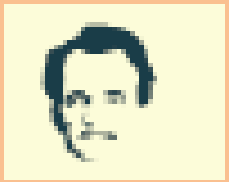
- Have an explore and see what you think
- These are great for engaging the reader…perhaps less so for rapidly transferring simple information
- Be inspired! These are created by teams of people including graphic designers and analysts using specialist software over many months.
- Enjoy but don’t worry, this is not the standard we expect in your assessment

Complex data visualisation

- Animation
- The video of Hans Rosling animating population data is probably the classic data animation.
- A variety of tools are used to tell such engaging narrative stories with data using animation.
- Here is another example https://www.youtube.com/watch?v=m1k91ynqFIU

- Animation is probably one of the most engaging ways to present data to a non technical audience as it allows you to take the user with you through the data. Story telling is at the heart of this approach.
- It is, however, not quick to create.

10 Take Away Tips-Data Stories



- Pick winners – don't do everything
- Effort should be proportional to impact
- Need some basic skills
- Tools help but not essential
- Think about the message
- Think about the audience
- Think about the context
- Go carefully with images and cartoons
- Don't distort data
- Use colour and layout to tell the story