



Essential Design Principles for Tableau

Visual Lies and Cognitive Bias



Seeing is believing!

Sometimes, believing is
seeing!

Beliefs, biases and
mental models can
distort interpretation

Data visualizations
should reveal patterns
clearly and accurately



Don't introduce
distortions through
design

Prevent false conclusions
based on biases

Clarify data to lead users
to correct conclusions





The right data in right
form is not enough

Know your users

Design to meet their
needs simply, directly,
and completely



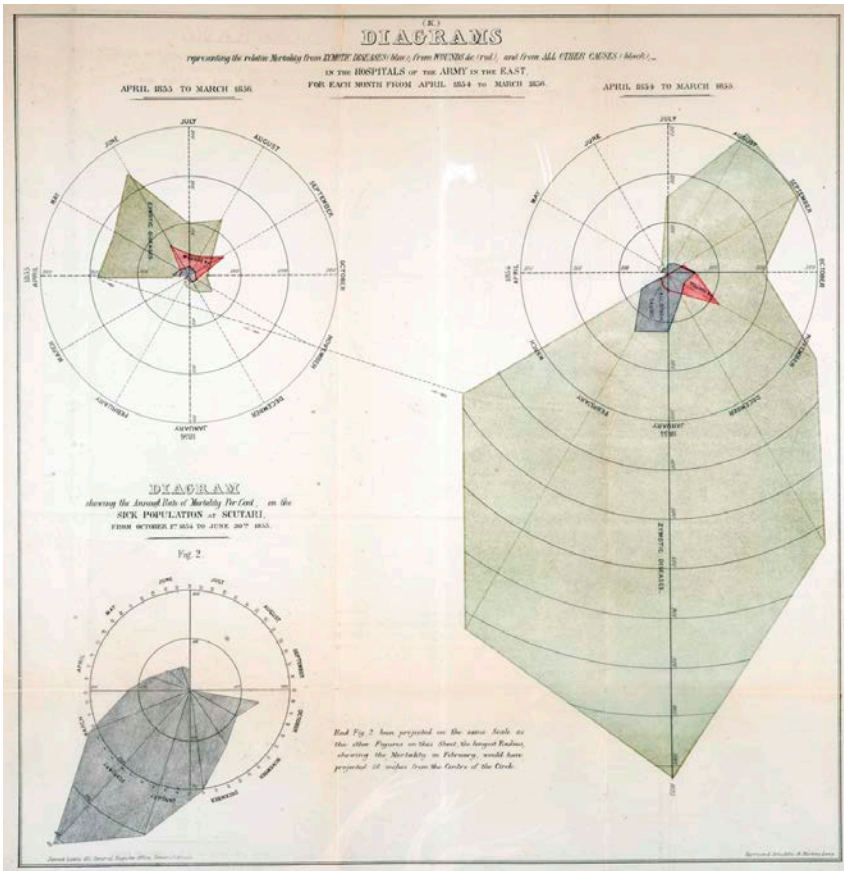
Source: http://libweb5.princeton.edu/visual_materials/maps/websites/thematic-maps/quantitative/medicine/medicine.html

Florence Nightingale
Nurse
Social reformer
Data visualizer



Source: http://libweb5.princeton.edu/visual_materials/maps/websites/thematic-maps/quantitative/medicine/medicine.html

“...affect thro’ the Eyes’
what we fail to convey to
the public through their
word-proof ears.”



Mortality rates of British soldiers from all causes

More soldiers were dying of preventable causes than battle

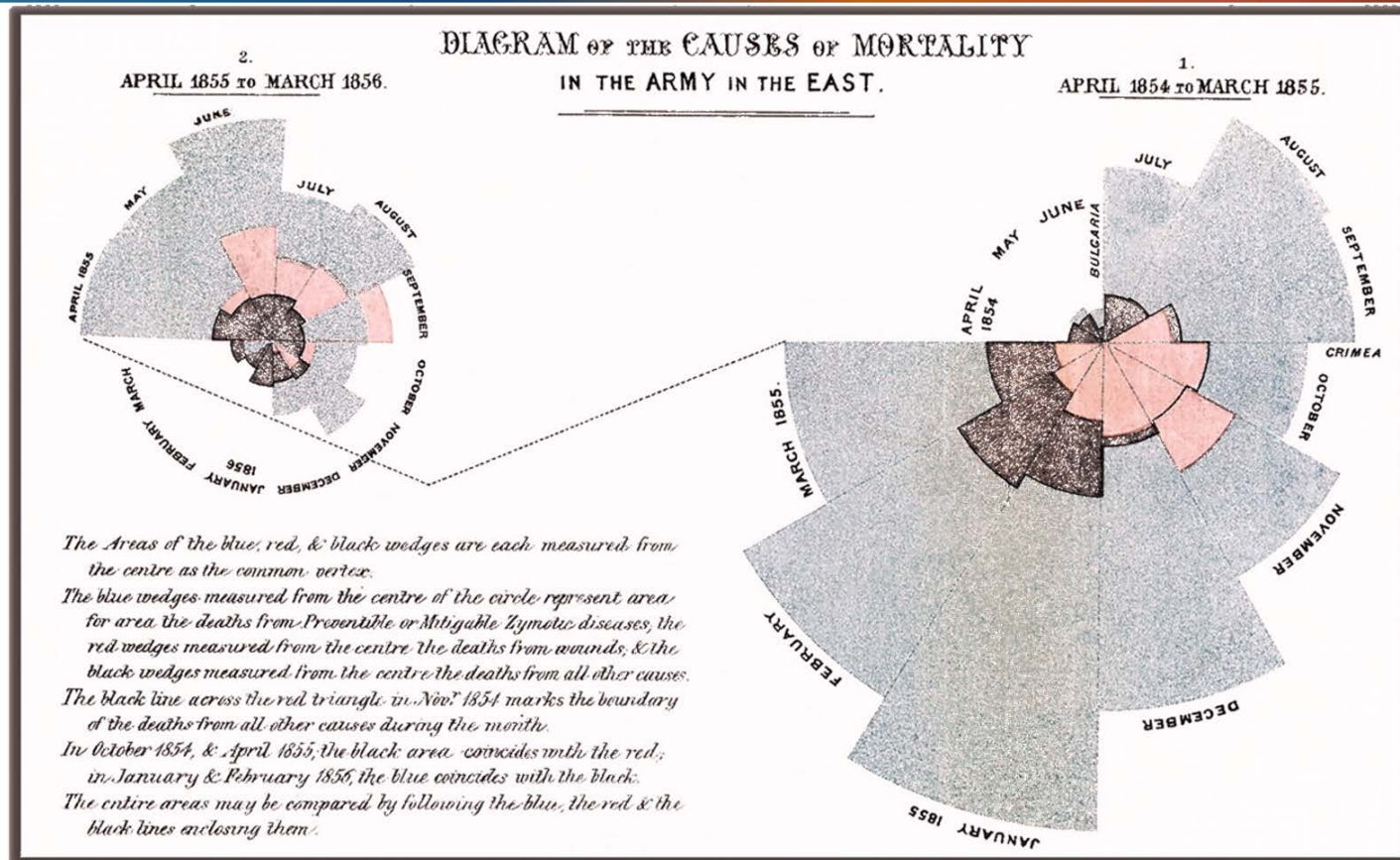


Diagram of the Causes of Mortality in the East by Florence Nightingale (public domain) https://en.wikipedia.org/wiki/Florence_Nightingale#/media/File:Nightingale-mortality.jpg

Underlying data is visually exaggerated by wedge design

Even knowing that does not stop the visual influence

Make data visualization tell stories as honestly as possible





Design choices can
create distortions

Or counteract cognitive
biases

Anticipate and respond
to common audiences
biases

Recall intro video
demonstrating
survivorship bias

They were forgetting
critical damage





Show multiple view of
data for returning
planes

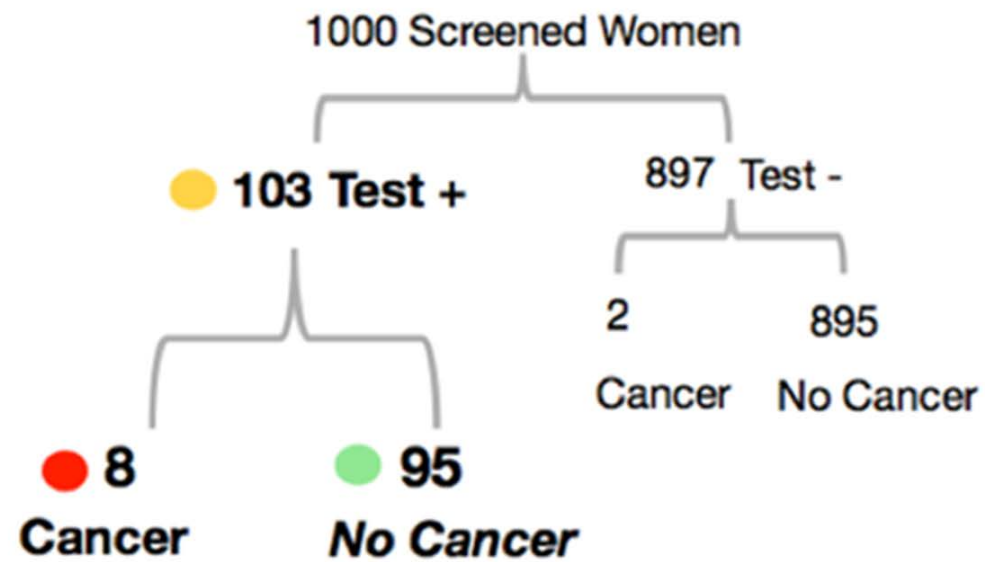
Visualize unseen
potential damage for
non-returning planes

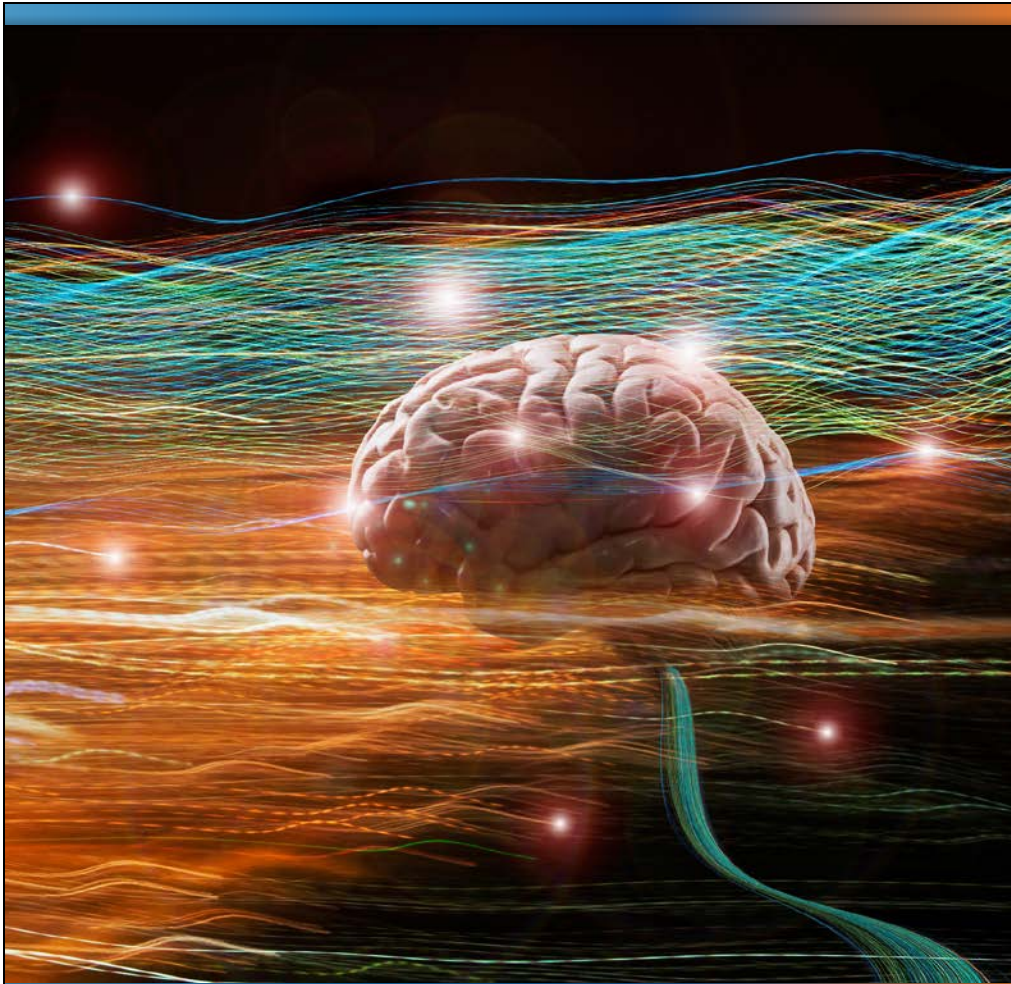
Such thinking is
difference between life
and death



Does Nancy have cancer?

	Has Breast Cancer	Doesn't Have Breast Cancer	Total
Positive Mammogram	(a) 8	(b) 95	103
Negative Mammogram	(c) 2	(d) 895	897
Total	10	990	1000





Human brain hardwired
for visualization

Visual language of
elements used to
communicate meaning

Consider audience's
needs and abilities to
decide on design

Transform data into:
Clear
Accurate
Meaningful
Insights in people's
mind

