

Statistics in the Middle Years: Evidence and Practice

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with thanks to Pip Arnold and Maxine Pfannkuch

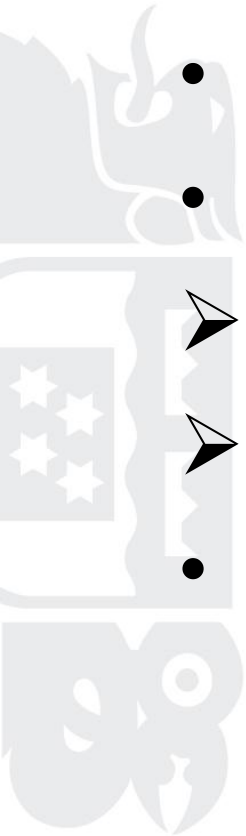
Presentation for the New Zealand Statistics Association conference
Statistics Education day
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Victoria University of Wellington, Wellington, New Zealand



Overview

- Overview of book
- Values and themes across the book
- Statistics education focus
 - Describing Distributions
 - Statistical Literacy
- Sample activities



Mathematics and Statistics in the Middle Years: Evidence and Practice

- each chapter relevant across Years 7-10
- schools and academics involved from around New Zealand
- 18 chapters (56 authors – teacher academic partnerships)
- 60 reviewers (teachers, academics, and student teachers)
- Published by NZCER early 2015

Mathematics and Statistics in the Middle Years: Evidence and Practice

Four values through the chapters towards equitable statistics and mathematics education:

respect

developing leadership

community

inclusion

And a further theme:

use of digital technology



Describing Distributions

Chapter 14

Pip Arnold and Maxine Pfannkuch

Kaua e mate wheke mate ururoa

*Don't die like an octopus,
die like a hammerhead shark*

Overview

- **Describing distributional shape**
 - Students sketch the distributional shape of graphs and then group them, from here the two main aspects of shape description are “discovered”, symmetry and modality
- **Predicting distributions**
 - Given the variable and the population students sketch their prediction of the distribution
- **Describing distributions**
 - Aspect of distributions are considered and described for the different situations, considering context: VARIABLE, VALUES and UNITS

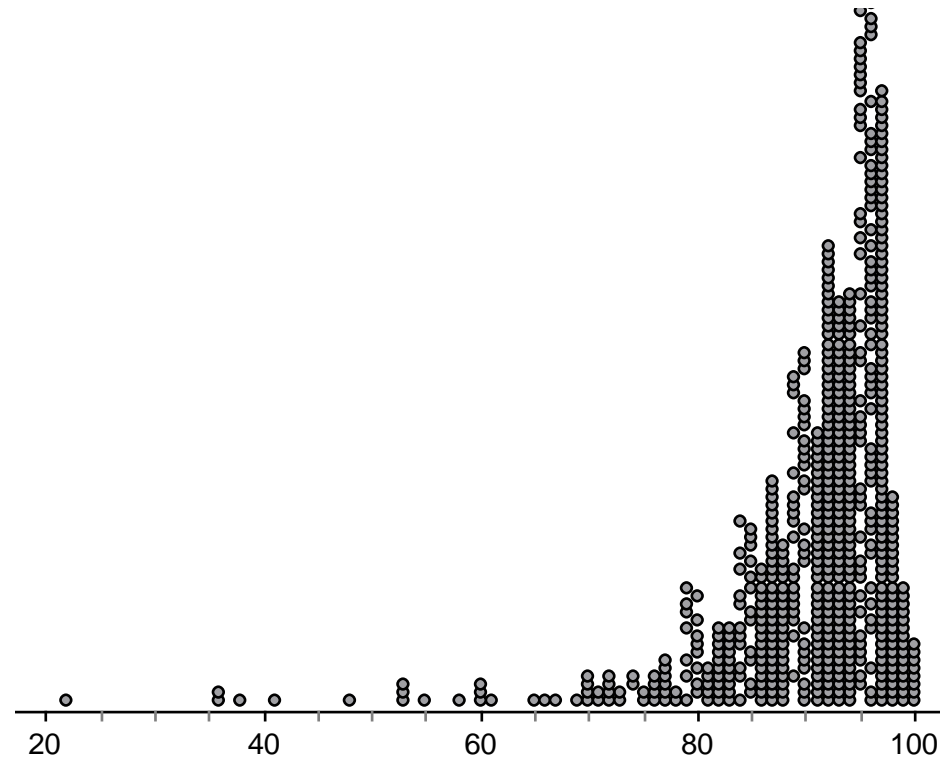


Predicting distributions

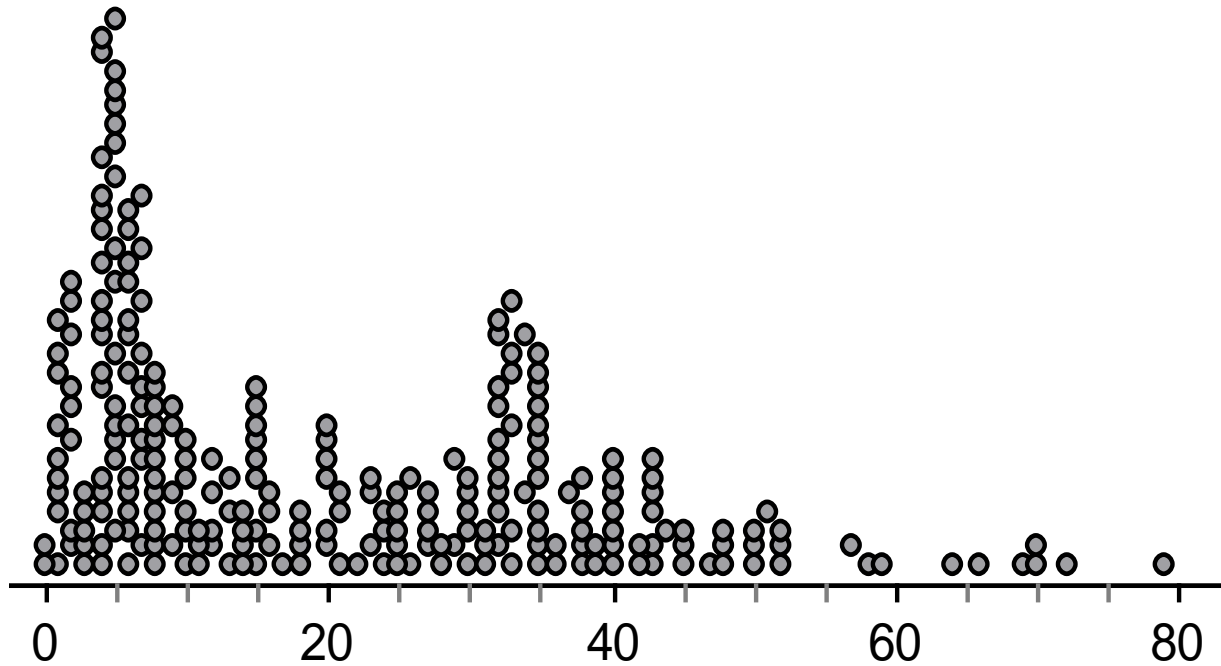
- Work with your partner to sketch the distribution for the following three situations
 - Attendance in percentage half days, year 9-13 students
 - Hair length in cm: year 4-13 students
 - Age in years: everyone at a high school



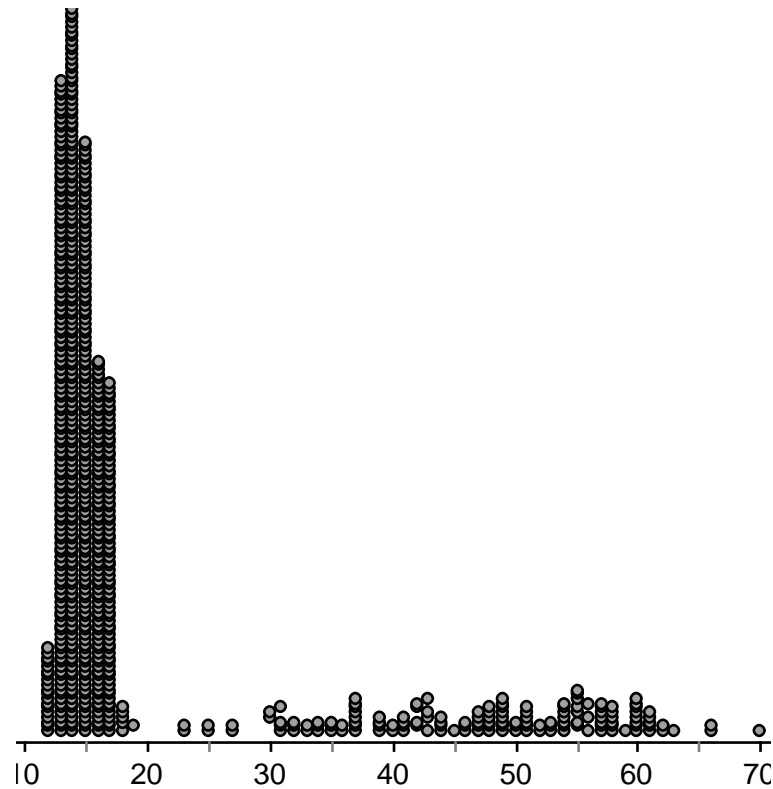
Attendance percentage half days



Hair length in cm



Age of everyone at a high school



Enhancing Statistical Literacy through Critical Questions and Real World Examples

Chapter 12

Sashi Sharma, Phil Doyle, Viney Shandil, and
Semisi Talakia'atu

Nāu te rourou, nāku te rourou, ka ora te
manuhiri

*From your food basket and from mine, the
people will thrive.*

<http://www.korero.maori.nz/forlearners/proverbs.html>



What is Statistical Literacy?

Statistical literacy is the ability to interpret results from studies and media reports and to be able to pose critical and reflective questions about those reports.



Components of Statistical Literacy

Interrelated knowledge bases:

- mathematical knowledge
- statistical knowledge
- knowledge of the context
- literacy skills
- critical questions

Dispositional elements:

- beliefs and attitudes
- a critical stance



Statistical Literacy Learning Environment

- Use real data and classroom activities to engage students
- Stress conceptual understanding rather than mere procedures
- Foster active learning
- Promote classroom discourse
- Use a range of assessment to improve and evaluate learning



An Example: Texting

“A typical teen sends about 50 texts a day,” 2009

- Introduce the context: literacy focus
- Small group work
- Wrap-up discussion
- Brief assessment task



Points to Ponder

- How would your students react to the claims made in the Texting activity?
- What are some advantages and limitations of using media reports in the classroom?



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Mathematics and Statistics in the Middle Years: Evidence and Practice

Also included in the book:

a range of ideas for teaching and learning of algebra, number, geometry, measurement

Equitable teaching, SOLO taxonomy, **maths for environmental justice**, **science through mathematics (rocket maths)**, traditional Māori systems and language of spatial orientation, mixed ability, mathematical discussion, peer tutoring, challenging tasks, using show and tell technology, large numbers...

Mathematics and Statistics in the Middle Years: Evidence and Practice

Further ideas for digital technology for statistics teaching and learning also included in the book:

Addendum

Apps, e.g.,

‘Quick graph’

‘Simpulse StatCalc’

and

Web 2.0 tools, e.g., ‘Socrative’

Develop an understanding of the integration and use of web based tools and apps for student and teacher devices



The use of technology
in the internally
assessed
Achievement
Standards.



Questions

