Public health implications of poor vitamin D measurement

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Questions:
1. What is the prevalence of vitamin D deficiency in different populations?
2. Does this need public health management, e.g. food fortification?

- Inaccurate (biased low) measurement may create a public health problem – widespread vitamin D deficiency – where none really exists

- Accurate measurement is required to determine the optimal level

OR

- Assessment of prevalence of “deficiency” is meaningless if not using the same assay on which cut-point decisions have been made
Public health: the importance of accuracy

Prevalence of vitamin D deficiency (<50nmol/L) in an Australian Study:
(different aliquots of the same sample)

1. Diasorin Liaison Total, Lab 1: 46% (355/765)
2. LC-MS/MS, Lab 3: 17% (128/765)
3. Diasorin Liaison Total, Lab 2: 36% (76/209)
4. LC-MS/MS, Lab 3: 20% (41/209)

Is vitamin D deficiency common in Australia?
Similar data to those from Lab 1 have led to calls for mandatory fortification of foods
Public health: the importance of accuracy

• More is not necessarily better

• U-shaped associations shown for a range of health outcomes, e.g. prostate cancer, tuberculosis, frailty, schizophrenia etc.

• Assays that read spuriously low, may be putting people’s health at risk by pushing them, unknowingly, into the upswing of the U
Public health research: precision (and accuracy)

1. The problem of misclassification of the exposure
   • Is vitamin D deficiency a risk factor for disease X?

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Disease is twice as common in those with vitamin D deficiency compared to normal vitamin D (30/45, cf. 5/15)

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No evidence of increased disease risk in relation vitamin D deficiency
2. Research: longitudinal data

A. Cohort studies, e.g. in multiple sclerosis research
   Repeated measures very useful to answer questions of prevention, reduction of relapse rate, prevention of secondary progression etc – but only useful if the measurements are comparable

B. National Health Surveys: consistency of measurement allows the creation of a huge international cohort with repeated measures over time – a rich data resource
Public health importance of standardisation of vitamin D measurement

Vitamin D is not innocuous
• Both high and low levels may increase health risks

Mandatory food fortification is a BIG decision
• Shifting the mean of the population shifts some people to high levels

Research dollars may be wasted and incorrect findings result from inaccurate and imprecise assays