Health Workforce Supply Forecasting Model

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About Health Workforce New Zealand

• Health Workforce New Zealand leads and supports the training and development of the health and disability workforce.

• HWNZ has contracts for the provision of training with district health boards (DHBs), tertiary education providers and other health provider organisations. These are the specification requirements and eligibility criteria for HWNZ-funded programmes in:

  Medical, Nursing, Dental, Allied Health, Mental Health, Disability Support Services, Midwifery, etc
Example of age distribution of a specialist workforce

Source: 2014 RNZCGP Workforce Survey Report
Identifying patterns

Big Data: extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions.

Source: http://grigory.us/big-data-class.html
Forecasting

https://positivepsychologyprogram.com/affective-forecasting/
For each scope and any geographical sub group

Conceptual diagram of medical workforce supply
Tools used?
For the pre-existing specialists at k year(s) can be calculated by

\[ O_{ij,k} = \begin{cases} O_{i-1,j,k-1} \times (1 - L_{i-1,j,k-1}) & \text{for } i = 20 - 74, \\ O_{i-1,j,k-1} \times (1 - L_{i-1,j,k-1}) + O_{ij,k-1} \times (1 - L_{ij,k-1}) & \text{for } i = 75 +, \end{cases} \]

Number of new and re-entered specialists remain after k year(s) can be calculated by

\[ E_{ij,k} = G_{j,k-1} \times A_{i,j,k-1} + E_{i-1,j,k-1} \times (1 - L_{i-1,j,k-1}) \]

Expected number of specialists in Head Count (HC) for i, and j after k year(s) can be calculated by

\[ H_{ij,k} = O_{ij,k} + E_{ij,k} \]

Expected number of specialists in Full Time Equivalent (FTE) for i, and j after k year(s) can be calculated by

\[ F_{ij,k} = H_{ij,k} \times R_{ij,k} \]

Total number of specialists for j specialty after k year(s) in HC can be calculated by

\[ \sum_{i=20}^{75+} H_{ij,k} \]

Total number of specialists for j specialty after k year(s) in FTE can be calculated by

\[ \sum_{i=20}^{75+} F_{ij,k} \]
Reflecting future workforce characteristics

- Variable exit rates for each age, scope, and year have been used to reflect generational characteristics of the workforce.

- Variable Full Time Equivalent (FTE) per Head Count (HC) ratio is used for each age, scope, and future year have been used to reflect different patterns of working over different parts of the lifespan, generational characteristics.

- New/re-entering practitioners includes new practitioners from training, immigrations to New Zealand, and re-entering practitioners after having a break.
General Practitioners in NZ
General Practitioners in NZ
General Practitioners in NZ
General Practitioners in NZ
General Practitioners in NZ
General Practitioners in NZ

General Practice Workforce by Age Group - Head Count

General Practice Workforce by Age Group - FTE

2016 Total: 3444
2021 Total: 3871

2016 Total FTE: 2959.5
2021 Total FTE: 3309.4
General Practitioners in NZ
General Practitioners in NZ
General Practitioners in NZ
General Practitioners in NZ
General Practitioners in NZ
General Practitioners per 100,000 60+ age population
(235 entries per year)
General Practitioners per 100,000 60+ age population
(300 new entries per year)
Emmanuel wins Data Olympics at International Health Workforce Collaborative

Emmanuel Jo, Principal Technical Specialist, from Workforce Education Intelligence and Planning, HWNZ, People and Transformation, has taken out the top prize at the ‘Data Olympics’ held as part of the recent International Health Workforce Collaborative (IHWC).

The 16th Collaborative was held in Washington, DC from 24-28 October 2016 hosted at Association of American Medical Colleges. The invitation only conference, provided delegates with a unique opportunity to discuss key global and local workforce issues in the United States, Canada, the United Kingdom, Australia and New Zealand. This is first time the New Zealand Ministry of Health participated in the IHWC. Emmanuel gave an outstanding presentation at the Data Olympics and won gold for New Zealand in challenge 1.

The ‘Data Olympics’ explored three challenges:

- How are you modelling future health workforce supply, accounting for workforce and broader health system changes?
Conclusions

The model has been, and is very useful for:

- Providing evidence for prioritization of training funding for most regulated workforces (Medical specialists, Nurses, Midwives, Psychologists, etc)
- Exploring consequences of changing workforce policies (example: delaying retirement age, training numbers, FTE/HC ratios in future years, how age distribution of a workforce will change)
- Planning training volumes in collaboration with Medical Colleges
- Regional workforce planning (by building regional model using the same concept)
- Identifying future health workforce capacity to inform government health initiatives (example: National Bowel Screening Programmes)