Needs must: Changing the focus of workforce planning models

STEPHEN BIRCH

McMaster University, Canada and University of Manchester, UK

PROVIDERS, SERVICES AND OUTCOMES:

- Providers just one input in health care production function

  More doctors does not mean more health care per se

- Workforce covers a range of skills and disciplines

  Overlapping scopes of practice (substitutes) and interdependencies in production (complements)

- Services just one input in health production function

  Subject (patient) characteristics and context (NEEDS)

EFFICIENCY, EQUITY AND PLANNING

Publicly funded systems adopt NEEDS (for care) as system focus (e.g., UK NHS, Canada Health Act . . .)

- Efficiency: maximise health gains from available resources by prioritising greatest NEEDS (expected health gain)
- Equity: Equate access to care with NEEDS by weighting populations by relative NEEDS in distributing available resources
- Planning functions: Expenditure, services and workforce - independent and NEEDS-free

PHYSICIAN WORKFORCE PLANNING IN CANADA

1964 Royal Commission – Maintain pop-doc ratio(PDR) at 850

Increase med. school intake for expected population growth

1991 Barer-Stoddart report - PDR fallen rapidly – population growth less than projected

Stabilise PDR at 500-550 through package of measures including reductions in med school intake

1998 Canadian Medical Association (CMA) population growth exceeded physician growth post 1991, 5 less docs per 100,000 (PDR growth 2.6%, or less than 0.5% per year)

CMA estimated physician-population ratio to fall by 31% over next 25 years - med school intake increased

2004 PDR = 471 much less than previous targets

PHYSICIAN WORFORCE PLANNING IN CANADA

Between 1961 and 2003 63% increase in physicians *after allowing for population growth*

British Columbia: for every physician in 2005 there were 34 fewer people to care for than in 1996

Applying 1% annual reduction in needs and 1% annual increase in productivity to CMA estimates produces reduction of 27% in 'effective' PDR over next 25 years (Birch et al. 2007)

THE EXAMPLE OF PEDIATRICS

Numbers of pediatricians and children in US increase by 64% and 9% respectively by 2020

To maintain workloads need to 'expand services and expand patient populations beyond current age groups'

Shipman et al 2004

2008 American Academy of Pediatrics:

Recommendations for cholesterol screening and treatment for children age 2 and over

THE INEVITABILITY OF WORKFORCE SHORTAGES

- Doctor per population % increase since 2000 (1990):

United Kingdom	42 (69)
Australia	23 (43)
Canada	9 (14)
United States	10 (na)

- Despite rapid increases in supply, shortages reported in all countries (OECD 2009)

HEALTH WORKFORCE PLANNING: RECOGNISING THE PROBLEM

Commission on Future of Health Care in Canada 2002

- Integration with system planning
- Population needs focus
- Team based care, not professional silos
- National perspective

UK Health Committee 2007:

"*Disastrous failure of workforce planning* "

- Lacks long term and strategic planning
- Poor integration with service/financial planning

FROM PROVIDERS TO SERVICES: UTILSATION BASED WORKFORCE PLANNING

Provider-based planning:

Uses demography, *P*, and level of providers *N/P* as constant (current or target)

$$N^{rt} = \sum_{ij} N_{ij}^{r} = \sum_{ij} \left[\left(\frac{N_{ij}}{P_{ij}} \right)^{t} \times P_{ij}^{t} \right]$$

Utilisation-based planning:

Replaces level of providers by level of services *Q/P* and provider productivity *N /Q*

$$N^{rt} = \sum_{ij} N_{ij}^{rt} = \sum_{ij} \left[\left(\frac{N_{ij}}{Q_{ij}} \right)^{t} \times \left(\frac{Q_{ij}}{P_{ij}} \right)^{t} \times P_{ij}^{t} \right]$$

UTILISATION (OR SERVICE) BASED WORKFORCE PLANNING IN UK DENTISTRY

1978 Government green paper

Projected 'service use-population' ratios onto expected future population

Assumptions (implicit)

Needs constant : Ignores impact of diet, oral hygiene, fluoride

Productivity constant : Ignores technology (multi chairs, hygenists)

So why no excess supply?

Orthodontics (unplanned 'service deepening' or 'supplier induced demand')

UTILISATION (OR SERVICE) BASED WORKFORCE PLANNING

Perpetuates both over utilisation and unmet NEEDS

Inadequate conceptual basis:

Presented as *'demand'* based planning: exogenous

Utilisation = interaction of supply and demand

Demand for health care determined by providers through service recommendations to patients

Reflects provider interests = supply-based planning

(See Evans – Health Care Income-Expenditure Identity)

EXPENDITURE PLANNING (Di Matteo 2010, 2013)

- Regression analysis to identify factors associated with health care expenditure growth
- Use the estimated equation to plan future aggregate health care expenditures.

Model 1: physicians not included

Model 2: physicians added nothing to model that included service utilisation

"physician numbers are a modest policy concern for restraining health costs and other factors such as utilisation"

DAILY EXPRESS

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OFFICIAL OVER-50s ARE GETTING YOUNGER

They're fitter, richer, happier and live their lives to the full

BRITAIN'S over-50s are living longer, working longer – and staying younger longer.

They are healthier and wealthier and determined to live life to the full in a way their parents never did. Far from considering retirement, the over-50s are pursuing their careers as they enjoy the lifestyle of a younger generation. According to figures from the Office of National Statistics, they see age as no bar to travel, exercise or mastering new technology.

More than 80 per cent are buying their own homes and half have paid off their mortgages.

By **Sarah O'Grady**
Social Affairs Correspondent

FULL STORY: PAGES 4&5

HEALTHY AGING: % POPULATION REPORTING HEALTH AS POOR OR FAIR

Canadian Community Health Surveys 2001-2012

BIRTH YEAR	65-69	70-74	75-79	TOTAL (ALL AGES)
1920-24			33.60	33.60
1925-29		28.10	30.76	29.73
1930-34	21.94	23.73	26.38	24.25
1934-39	20.15	23.10	26.82	22.23
1940-44	18.59	18.09		18.22
1945-49	16.45			16.22
% change	-25.02	-35.62	-20.18	-51.73

HEALTH WORKFORCE PLANNING: HEALTHY AGING IN CANADA

OLS – Ages 55-84
(p-values in parentheses)

	Mortality		Mobility problems		Pain		Poor Self-Assessed Health	
	Males	Females	Males	Females	Males	Females	Males	Females
Age	0.0104 (0.0001)	0.0099 (0.0001)	0.0064 (0.0001)	0.0095 (0.0001)	0.0015 (0.0087)	0.0022 (0.0001)	0.0033 (0.0001)	0.0044 (0.0001)
Cohort	-0.0036 (0.0001)	-0.0017 (0.0005)	-0.0189 (0.0001)	-0.0286 (0.0001)	-0.0067 (0.0008)	-0.0071 (0.0001)	-0.0014 (0.0400)	-0.0022 (0.0005)
Age squared	0.000093 (0.0001)	0.000084 (0.0001)	--	--	--	--	--	--
Age* cohort	0.000063 (0.0001)	0.000030 (0.0001)	0.000280 (0.0001)	0.000418 (0.0001)	0.000093 (0.0012)	0.000098 (0.0002)	--	--
Intercept	0.3017 (0.0001)	0.2992 (0.0001)	-0.3758 (0.0001)	-0.5736 (0.0001)	-0.0697 (0.0840)	-0.1049 (0.0058)	-0.1732 (0.0010)	-0.2618 (0.0001)
Adj R^2	0.988	0.980	0.714	0.813	0.141	0.301	0.211	0.370

UK PREVALENCE OF SELF REPORTED LLSI* PER 1000 POPULATION BY AGE BAND,1985-2005

	Age group					
Year	0–14	15–44	45–64	65–74	75–84	>85
1985	57	103	262	380	458	610
2005	60	118	252	371	447	523
% diff	5.3	14.6	(3.8)	(2.4)	(2.4)	(14.3)

*LLSI = Limiting long standing illness

UK PREVALENCE OF OP VISIT PER 1000 POPULATION LAST 3 MONTHS BY AGE

	Age group					
	0-14	15-44	45-64	65-74	75-84	>85
LLSI						
1985	284	271	292	255	225	200
2005	294	254	295	310	337	324
% diff	*3.6*	*(6.3)*	*1.0*	*21.6*	*49.3*	*62.0*
No LLSI						
1985	99	100	101	115	110	111
2005	96	98	114	154	189	215
% diff	*(3.2)*	*1.6*	*13.7*	*34.0*	*71.6*	*93.2*

UK PREVALENCE OF GP VISIT PER 1000 POPULATION LAST 2 WEEKS BY AGE

	Age group					
	0-14	15-44	45-64	65-74	75-84	>85
LLSI						
1985	277	252	268	285	263	323
2005	217	304	295	301	270	330
% diff	*(21.7)*	*20.6*	*10.0*	*5.4*	*2.8*	*2.0*
No LLSI						
1985	139	115	99	98	128	193
2005	97	123	123	158	176	233
% diff	*(30.1)*	*6.5*	*24.5*	*61.6*	*37.4*	*20.9*

AN EARLY DIAGNOSIS

"Progress in medicine does not focus on doing existing things more cheaply and simply, but on discovering complex and difficult things to do that previously could not be done at all . . . the NHS was a miscalculation of sublime dimensions"

Enoch Powell, UK Minister for Health (1962)

PLANNING BY OBJECTIVES: NEEDS-BASED WORKFORCE PLANNING

Introducing *H* the average level of needs

$$N^{rt} = \sum_{ij}\left[\left(\frac{N_{ij}}{Q_{ij}}\right)^{t} \times \left(\frac{Q_{ij}}{H_{ij}}\right)^{t} \times \left(\frac{H_{ij}}{P_{ij}}\right)^{t} \times P_{ij}^{t}\right]$$

Determinants of requirements:

DEMOGRAPHY *P*: *Size and age-gender profile of the population*

EPIDEMIOLOGY *H/P*: *Levels and distribution of needs in the population*

LEVEL OF SERVICE *Q/H*: *the level of service planned for each level of need*

PRODUCTIVITY *N/Q*: *the inverse of the average level of productivity of providers*

NEEDS-BASED WORKFORCE PLANNING: A PRESCRIPTION FOR INEFFICIENCY?

Basu and Pak (2015):

Needs-based models: inefficient

- Some needs won't seek services so oversupply - non welfare-maximising

Utilisation-based models:

- incorporate personal preferences and socioeconomic factors to maximise social welfare (aggregate of individual utilities)

NEEDS-BASED WORKFORCE PLANNING: A PRESCRIPTION FOR INEFFICIENCY?

Assumes the objective of publicly funded health care systems is social welfare maximisation

If welfare maximisation is the goal, publicly-funded health care is unlikely to be a solution

Assumes utilisation reflects individuals' preferences

Ignores market failure in health care (caring externalities, asymmetry of information): the reason for government intervention in health care markets

NEEDS-BASED WORKFORCE PLANNING: A PRESCRIPTION FOR INEFFICIENCY?

Why inefficient?

"An individual with lower social standing must exert greater effort to obtain the same level of health care as someone with the same medical condition but with higher social standing"

So is social welfare maximisation the goal?

"Society may want to compensate for this inequality by setting accessibility levels. However, the precise way in which the compensation should occur depends on the objective of the society beyond mere efficiency and lies outside the scope of this paper"

If the objective of society is maximising health gains from available resources.....compensation based on NEEDS!

HEALTH WORKFORCE PLANNING: GETTING THE QUESTION RIGHT

Future of health workforce planning depends crucially on getting the question right

Planning done with no clear explicit policy question

No unambiguous right number of providers or right way of estimating future provider requirements

Determined by social choices about system objectives

Models and methods depend on policy question

For 'Utilisation-based models' to be the answer the question must be

'How many providers are required in the future to …

…maintain the current service levels by age and gender
…using the same models of service delivery