

# Physician Manpower and its impacts in Taiwan



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## Outline

- The status of physician manpower
- Physician manpower and its impacts on healthcare/ education
- Factors influencing physician demands
- Solutions

## "Physician shortage" is now a global concern

Google "physician shortage" 搜尋 進階搜尋

● 所有網頁 ● 中文網頁 ● 繁體中文網頁 ● 台灣的網頁

網路工具 顯示選項... 約有52,700項符合"physician shortage"的查詢結果，以下是第 1-10項

提示：如只要搜尋中文(繁體)的結果，可使用使用偏好指定搜尋語言。

2 結果 筆儲存存在您電腦的結果 - 隱藏 - 關於

Student Program Expanded... Meet Physician Shortage... To Meet Physician Shortage [TopNews]  
Learning from Japanese He... its physician shortage... ranged from physician reluctance in

有關 "physician shortage" 的學術文章

... trends signal an impending physician shortage - Cooper - 被引用 271 次  
Physician shortage in occupational and environmental ... - Castorina - 被引用 34 次  
The coming physician shortage - Cooper - 被引用 18 次

10 factors affecting the physician shortage of the future - Next! ☆ - [翻譯此頁]  
10 factors affecting the physician shortage of the future - Next! from Physician Executive provided by Find Articles at BNET.  
findarticles.com/p/articles/mi.../is\_5.../ai\_108547195/ - 頁庫存檔 - 類似內容

Workforce - AAMC ☆ - [翻譯此頁]  
The solution to the physician shortage lies in increasing efficiency, ... The Resident Physician Shortage Reduction Act of 2009 (H.R. 2251) would strengthen ...  
www.aamc.org/workforce/ - 頁庫存檔 - 類似內容

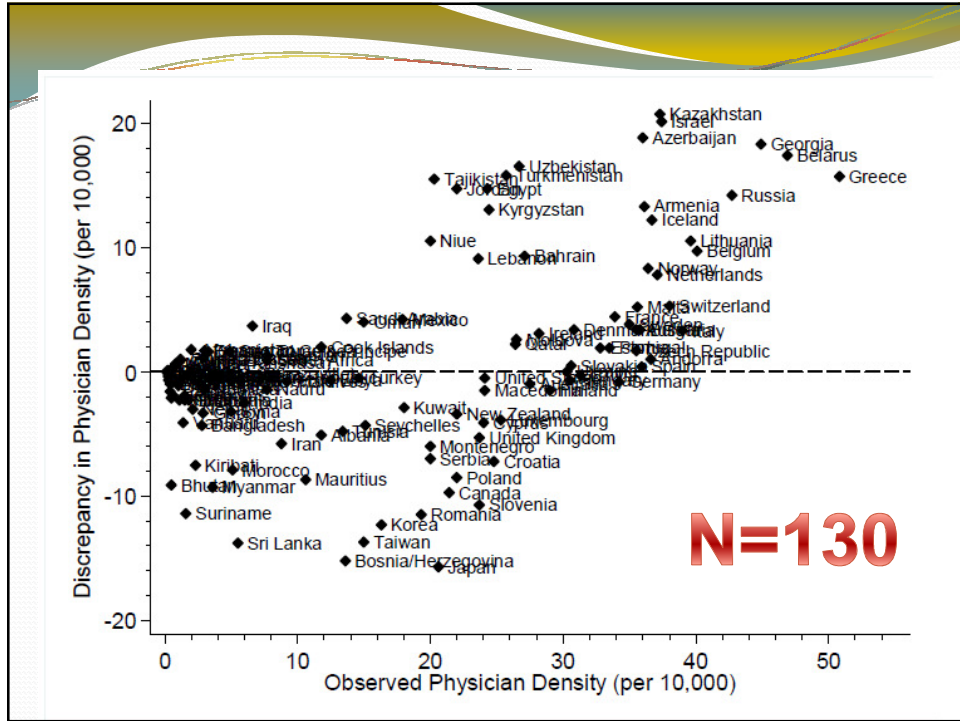
## Physician shortage in Taiwan

Tsuen-Chiuan Tsai, Peter H. Harasym, Misha Eliasziw (孩子、平均餘命、床數)

Table 3 Predicted and Observed Physician Inequities by Countries

Rank	Country or area	Predicted PD	Observed PD	Discrepancy	Population	MD Shortage	Continent	Economics
1	Japan	68.4	21.0	-47.4	126,804,433	-600,950	AS	High income: OECD
2	Barbados	33.9	12.0	-21.9	285,653	-625	NA	High income: nonOECD
3	Republic of Korea	36.9	16.0	-20.9	48,636,068	-101,683	AS	High income: nonOECD
4	Taiwan	31.4	15.0	-16.4	23,000,000	-37,797	AS	High income: nonOECD
5	Romania	32.8	19.3	-13.5	22,181,287	-29,987	EU	Upper middle income
6	Sri Lanka	18.7	6.0	-12.7	21,537,790	-26,724	AS	Upper middle income
7	Nicaragua	15.8	4.0	-11.8	5,995,928	-7,091	NA	Lower middle income
8	Singapore	26.3	15.0	-11.3	4,701,069	-5,320	AS	High income: nonOECD
9	Suriname	12.9	1.6	-11.3	486,618	-549	SA	Upper middle income

4<sup>th</sup> out of 177 countries





## Four Asian Dragons---

Japan is the number one ranked country of shortage.  
She experienced acute physician shortage

### The Imminent Healthcare and Emergency Care Crisis in Japan

**Tetsuji Suzuki, EMT\***  
**Masamichi Nishida MD, PhD†**  
**Yuriko Suzuki, RN‡**  
**Kunio Kobayashi MD, PhD\***

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Supervising Section Editor: Tareg Bey, MD  
 Submission history: Submitted December 12, 2007; Revision Received March 13, 2008; Accepted March 14, 2008.  
 Reprints available through open access at [www.westjem.org](http://www.westjem.org)

**Objectives:** Japan has a universal healthcare system, and this paper describes the reality of the healthcare services provided, as well as current issues with the system.

## Estimate the required physician manpower

- Demand-based
- Need-based
  - Patient-centered
  - considering necessary medical intervention
- Disease-burden based



## How Taiwanese think....?

**The current physician manpower surpass the needs in Taiwan ?**

Physician density in Taiwan: historical records of the target and the status

Organization	Target	Status(reported year end)	Interpretation
CEPD 4322th meeting (1986)	13.3 (2000)		
Department of Healthcare Holistic Health Care Plan (2005)	14.9 (2005)	15.7 (2006)	Surpass
	15.5 (2007)	16.15 (2008)	Surpass

(Physician density: Physician number per ten thousand)

The Council for Economic Planning and Development (CEPD)

**In 1998, the limit of medical student enrollment 1200 → 1300/year**

## 問卷: 曾經指導國外醫學院畢業生(IMG) 或曾與其共事者(共245人)

### 3. 請問貴院為何使用這個/些IMGs? (可複選)

- |                          |                    |
|--------------------------|--------------------|
| 1. 解決醫師人力問題(175, 71.4%)  | 2. 國際化(68, 27.8%)  |
| 3. 為了加分成為教學醫院(34, 13.9%) | 4. 其他理由(47, 19.2%) |

### 4 請問若貴院不使用這個/些IMGs，會如何解決上述問題?

- |                        |                   |
|------------------------|-------------------|
| 1. 使用專科護理師(137, 55.9%) | 2. 沒影響(73, 29.8%) |
| 3. 無法解決                | 4. 其他             |

## 問卷: 曾經指導國外醫學院畢業生(IMG) 或曾與其共事者(共245人)

### 7. 您認為台灣缺醫師嗎? (醫師分佈不均等同醫師人力不足)

- |                  |                   |                  |
|------------------|-------------------|------------------|
| 1. 過剩(73, 29.8%) | 2. 差不多(57, 23.3%) | 3. 缺乏(99, 40.4%) |
| 4. 不知道(10, 4.0%) |                   |                  |

### 8. 為何國內不能再新設醫學院? (可複選)

- |                         |                      |
|-------------------------|----------------------|
| 1. 醫師人力已經過剩(149, 60.8%) | 2. 教師人力不足(57, 23.3%) |
| 3. 設校經費不足(34, 13.9%)    | 4. 其他(50, 20.4%)     |

### 9. 您認為使用IMGs會對國內醫師有何影響? (可複選)

- |                            |                  |
|----------------------------|------------------|
| 1. 排擠本國醫師的就業選科(123, 50.2%) |                  |
| 2. 降低本國醫師的收入(90, 36.7%)    |                  |
| 3. 沒有影響(69, 28.2%)         | 4. 其他(26, 10.6%) |

**Human defense mechanism !**

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- Factors influencing physician demands
- Solutions

## The consequence of physician shortage

### Physician escape:

- Mal-distribution : both geographically and in specialty

### Healthcare quality:

- Is there a doctor in the house /hospital ?

### Education quality:

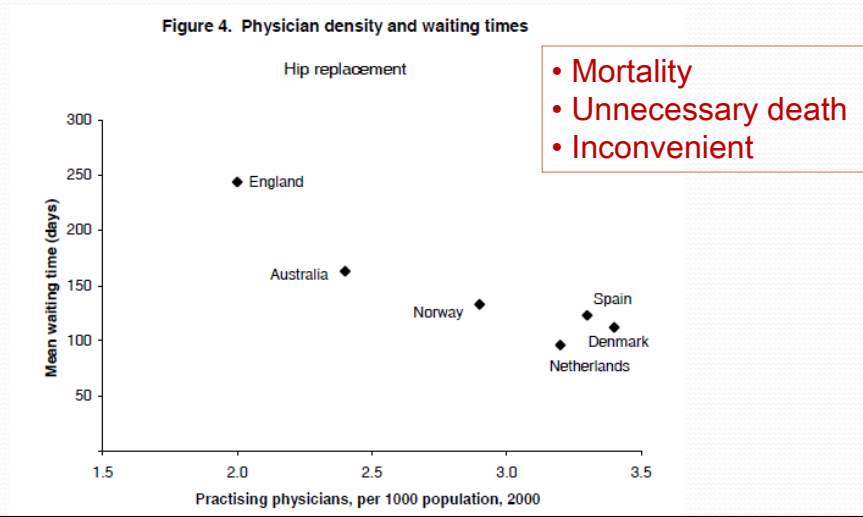
- Is there a teacher in the house/ hospital ?

**REJECTED**



# The Supply of Physician Services in OECD Countries

Steven Simoens and Jeremy Hurst. 16-Jan-2006





## Is it possible to have less physicians and better healthcare/ educational quality?






An example in Pediatrics



# Required physician manpower

**1+1=2**

**3 groups: N, I, A**

- N: None (23.5%)
- I: Inadequate (62.4%)
- A: Adequate (14.11%)

**Short of 159 residents (73\*3-60)**

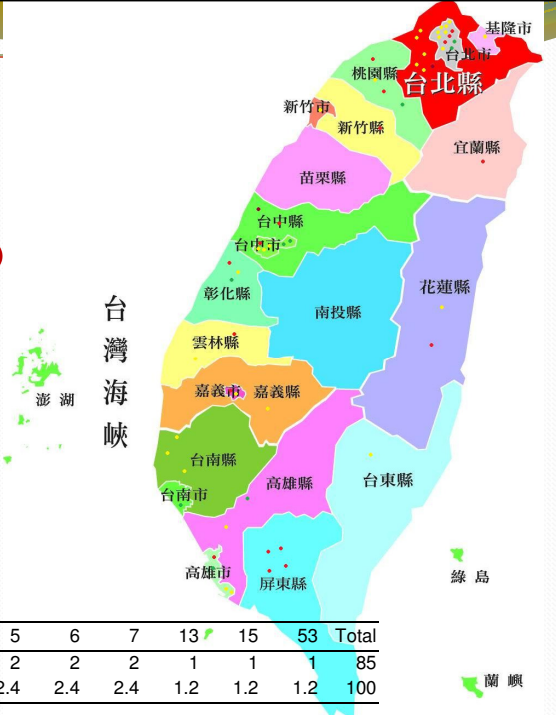
~~NP/CNS/PA?~~

~~ENT?~~

~~Family doctor? ER?~~

**188** Pediatric residents in total in 2009

**138** R1 in 2006



台灣海峽

R size*	0	1	2	3	4	5	6	7	13	15	53	Total
Count	20	46	7	1	2	2	2	2	1	1	1	85
%	23.5	54.1	8.2	1.2	2.4	2.4	2.4	2.4	1.2	1.2	1.2	100

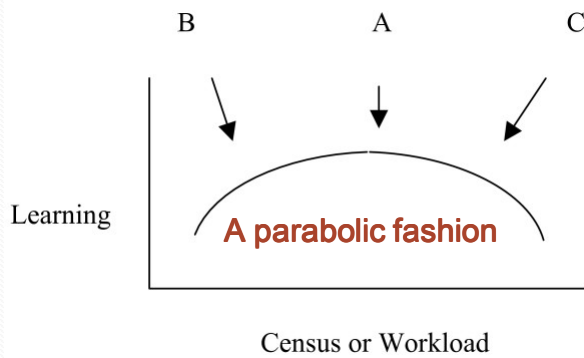


## Physician shortage and medical education

Heavy workloads (less sleep while on call, longer shift durations, more documentation)

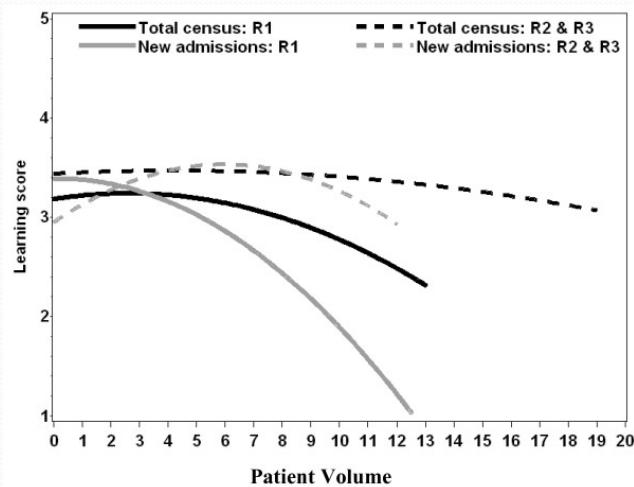
→ Participate less in educational activities + less supervision, less direct observation

*Haney et al. BMC Medical Education 2006 6:35*



## Parabolic curves for learning vs. number of patients for R1's and R2/R3's.

*BMC Medical Education 2006, 6:35*



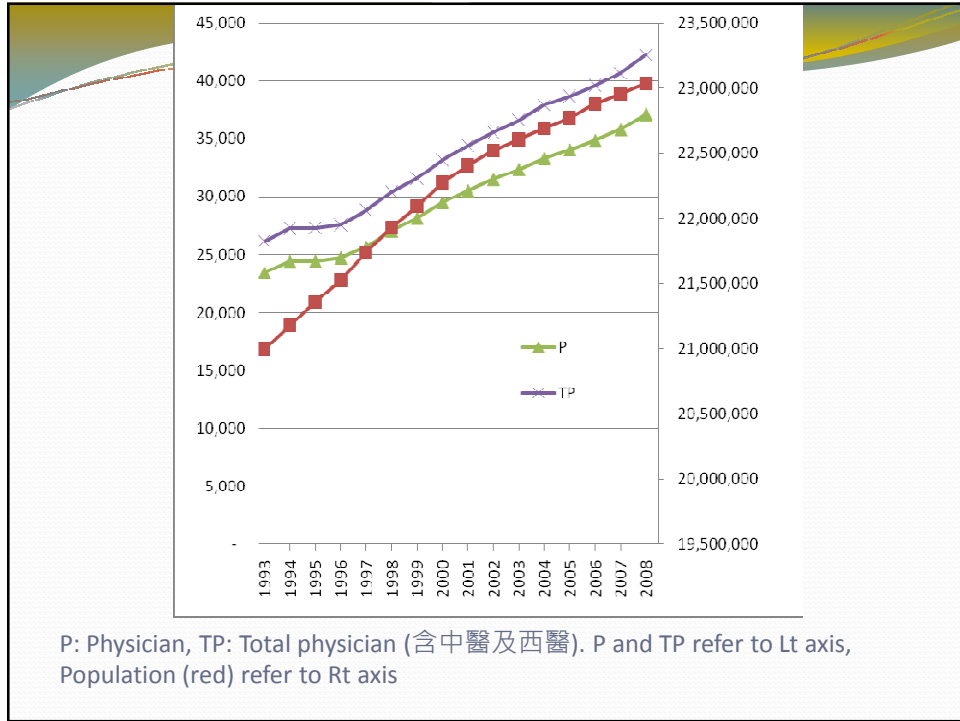
## Outline

- The status of physician manpower
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- **Factors influencing physician demands**
- Solutions

## Factors influencing physician demands

- Population size (physician density)
- Population demography (seniority, children, literacy)
- Health indicators (life expectancy, mortality)
- The design of healthcare system (beds)
- Socioeconomic status (GDP, GNP, PPP, health expenditure)





## Population in Taiwan remained increasing

2004-2009 in Taiwan, the increment rate ranged 3.58-4.66/thousand population

表 8 臺灣地區高、中及低推計之總人口數

年別 (民國)	年底總人口 (千人)			年底總人口成長率 (%)			人口零成長 之時點	
	高推計	中推計	低推計	高推計	中推計	低推計		
97	22,961	22,960	22,956	3.7	3.6	3.4		
102	23,369	23,346	23,319	3.3	3.1	2.8		
107	23,709	23,642	23,560	2.5	2.1	1.5		
(未來 20 年間)	112	23,938	23,808	<u>23,646</u>	1.5	0.9	<u>0.2</u>	112 年底推估
	113	23,968	23,824	23,645	1.3	0.7	-0.1	
	114	23,993	23,833	23,636	1.0	0.4	-0.4	
	115	24,012	<u>23,837</u>	23,622	0.8	<u>0.1</u>	-0.6	115 年中推估
	116	24,025	23,834	23,601	0.5	-0.1	-0.9	
	117	<u>24,031</u>	23,823	23,572	<u>0.3</u>	-0.5	-1.2	117 年高推估
	125	23,766	23,413	23,020	-2.8	-3.7	-4.5	
	135	22,659	22,091	21,442	-6.0	-7.2	-8.9	
	145	21,135	20,287	19,270	-7.7	-9.5	-11.9	

資料來源：本報告。

## Newly registered physician in Taiwan (per year): 2004-2008

Year	2004	2005	2006	2007	2008	Total (2004-8)
IMG	70	52	77	82	81	362
RMG	1232	1262	1278	1305	1400	6477
IMG/Total (%)	5.4%	4.0%	5.7%	5.9%	5.5%	5.3%

IMG: International Medical Graduate; TWA: Taiwanese Medical Graduate

Physician density (n/10,000) =

$$(1.751 - 0.075 \times \text{proportion under age 15 years} + 0.048 \times \text{life expectancy} + 0.025 \times \text{hospital beds})^2$$

Children ↓

Life expectancy ↑

Hospital beds ↑

## Other factors (2008)

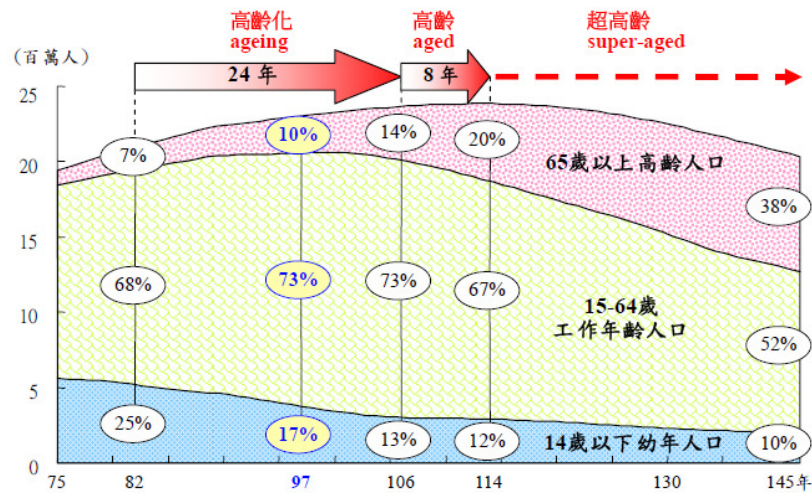
### Productivity:

- 檢核醫師/乙種醫師 620 (1.64%)
- 70歲以上醫師 1693(4.43%)
- 女醫師 5492(14.78%)

### Brain drain: 台商醫院？國外需求？

醫院	成立時間	地點	初期病床數(床)	未來病床數(床)	所屬企業集團
旺旺醫院	2005/12	湖南長沙	500	1500	旺旺集團
明基醫院	2008/1	江蘇南京	500	3000	佳世達科技
長庚醫院	2008/5	福建廈門	500	3000	台塑集團
宗仁卿醫院	2008/11	江蘇昆山	200	500	六和集團
台心醫院	2008/6	廣東東莞	600	600	東莞台商協會

## The change of population structure in Taiwan: 3 stages from 2008-2056



說明：圖內百分比數字代表三階段人口年齡結構百分比。  
資料來源：1.內政部，中華民國人口統計年刊，各年。

# Save money or pay out later ?

- Labour/ physician workforce is the principle component  
→Health expenditure
- GDP/GNI per capital best predictor of health expenditure

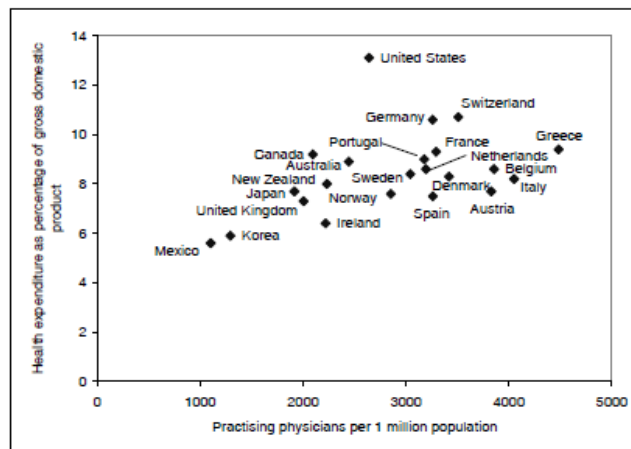
某醫學中心醫護人員平均薪資

以工作上限計：住院醫師：400小時/月；專科護理師：240小時/月

	住院醫師	專科護理師	資深護理師
外科系 R1(年薪)	143萬元	84-101萬元	64-98萬元
(時薪)	298元	350元	340元
內科系 R1(年薪)	123-126萬元		
(時薪)	262元		

## A weak positive association between physician density and the health expenditure (OECD countries)

Figure 5. Physician density and health expenditure, 2000



Note: The correlation co-efficient for these variables is 0.45 and the R<sup>2</sup> is 0.20.

## Total Health Expenditures as % of GDP

### 2002-2005 - Country Rankings

Rank	Location	2000	2001	2002	2003	2004	2005
1	Marshall Islands	22	19.1	18.4	16.3	13.2	15.4
2	United States of America	13.2	13.9	14.7	15.1	15.2	15.2
3	Niue	8	38.1	11.1	12.5	15.5	14.5
4	Timor-Leste	8.8	8.6	8.5	9.2	10.3	13.7
5	Micronesia (Fed. States of)	9	9.8	9.1	10.7	11.7	13.5
6	Kiribati	11.6	12.3	12.6	13.7	13.7	12.7
7	Maldives	6.8	6.8	6.6	7.2	7.8	12.4
8	Malawi	6.1	7.8	10	12.8	12.8	12.2
9	Switzerland	10.3	10.7	11	11.4	11.4	11.4
10	France	9.6	9.7	10	10.9	11.1	11.2
11	Germany	10.3	10.4	10.6	10.8	11.1	11.2
12	Jordan	9.4	9.6	9.3	9.3	9.3	9.3
13	Nauru	11	10.8	10.6	10.3	10.3	10.3
14	Argentina	8.9	9.5	8.9	8.3	8.3	8.3
15	Austria	10	10	10.1	10.2	10.2	10.2
16	Portugal	8.8	8.8	9	9.7	9.7	9.7
17	Greece	9.3	9.8	9.7	10	10	10
18	Canada	8.8	9.3	9.6	9.8	9.8	9.8
88	<a href="#">Haiti</a>	6.1	6.2	6.2	6	6	6.2
89	<a href="#">Poland</a>	5.5	5.9	6.3	6.2	6.2	6.2
90	<a href="#">Cyprus</a>	5.7	5.7	6.1	6.5	6.3	6.1
91	<a href="#">Egypt</a>	5.6	6	6.3	6.4	6.1	6.1
92	<a href="#">Kyrgyzstan</a>	4.7	4.8	5.4	5.4	5.7	6
93	<a href="#">Korea, South</a>	4.4	5.3	5.2	5.5	5.5	6
94	<a href="#">Saint Vincent &amp; the Grenadines</a>	5.7	5.7	6.1	6	6	6
95	<a href="#">Viet Nam</a>	5.4	5.7	5.2	5.3	5.7	6
96	<a href="#">Lithuania</a>	6.5	6.3	6.4	6.5	5.7	5.9
97	<a href="#">Saint Lucia</a>	5.5	5.9	5.9	5.7	5.8	5.9

Taiwan



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- The status of physician manpower
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## Solutions: general

- Increase physician manpower
  - New medical school/increasing size
  - International medical graduate
- Resident matching program (regulatory policies and financial policies)
- Educational policies
- Focus on the necessary/critical medical intervention
- Restructure healthcare system, e.g., assigned hospitals for education, joint program, combined service

## Solutions: Healthcare providers

- More competent
- More efficient
- More dedicated to care
- Being more willingness to go rural area
- Delaying their retirement



## Consider shortening training course from 4 to 3 years?

*Canadian Medical Education Journal* 2010, 1(1)

### Canadian Medical Education Journal

*Major Contribution/Research Article*

#### Should Canadian Medical Schools Implement a Widespread 3 Year Medical Curriculum?

*Douglas B Page and Adrian Baranchuk*

Queen's University, Kingston, ON

Published: 15 March, 2010

CMEJ 2010, 1(1):e39-e45 Available at <http://www.cmej.ca>

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### Assigned hospitals for education



#### 服務型

- 沒有住院醫師
- 主治醫師一線值班



#### 教學研究型

- 有學生/R
- 主治醫師少值班
- 要教學研究

## No one can be forgotten

- Rural
- Children
- Disadvantaged



## Thanks for your attention

