

Understanding health workforce wastage in Mexico

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Background

Human Resources for Health

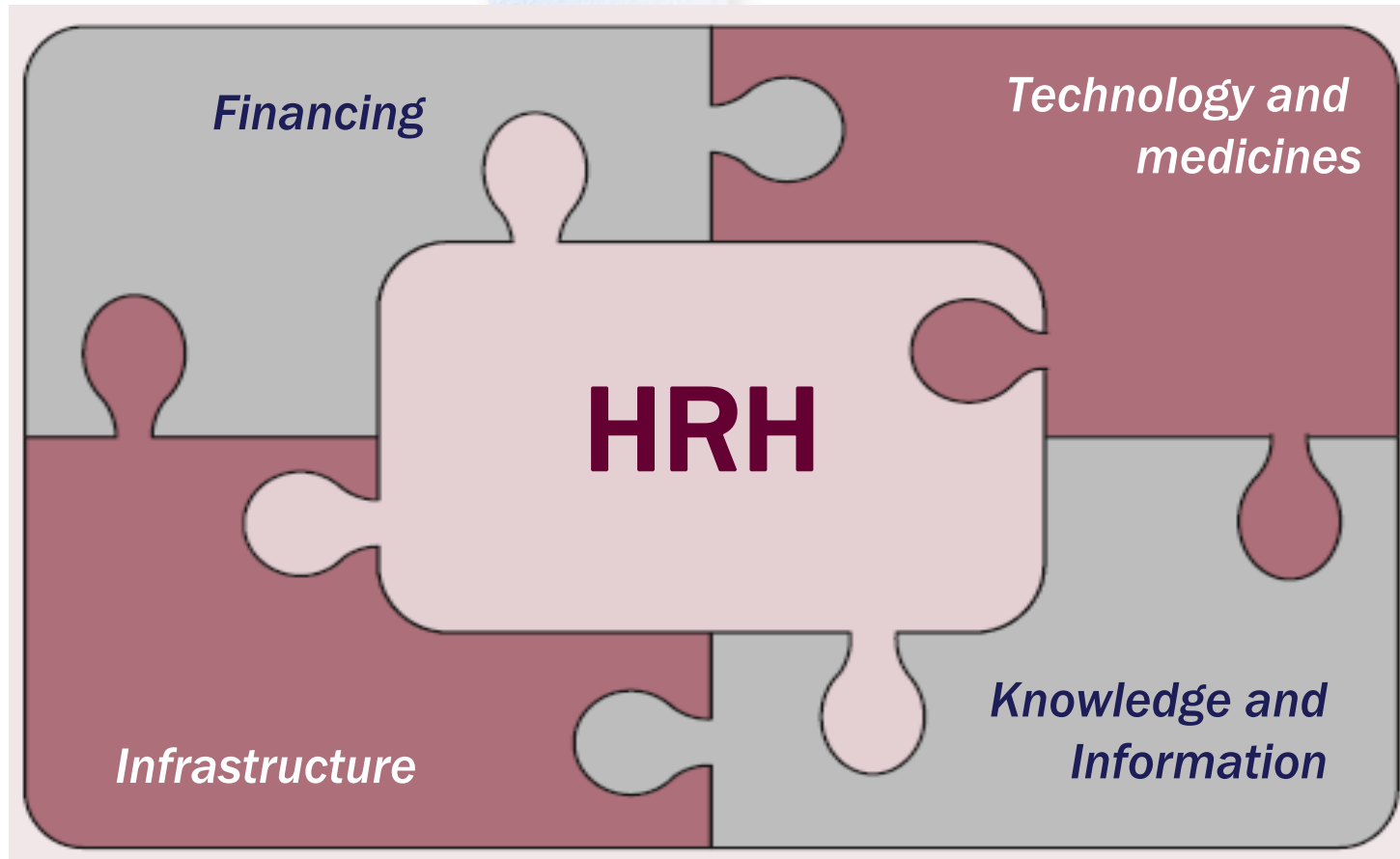
- “Classic economy considered labor force as another productive factor such as capital, natural resources, technology etc.

But:

- What a strange productive factor! HR is the only productive factor that gains value by using, learns, is conscious of the work process, disputes the control of work process and is capable of creating the productive factor itself” (Rovere, 2003).



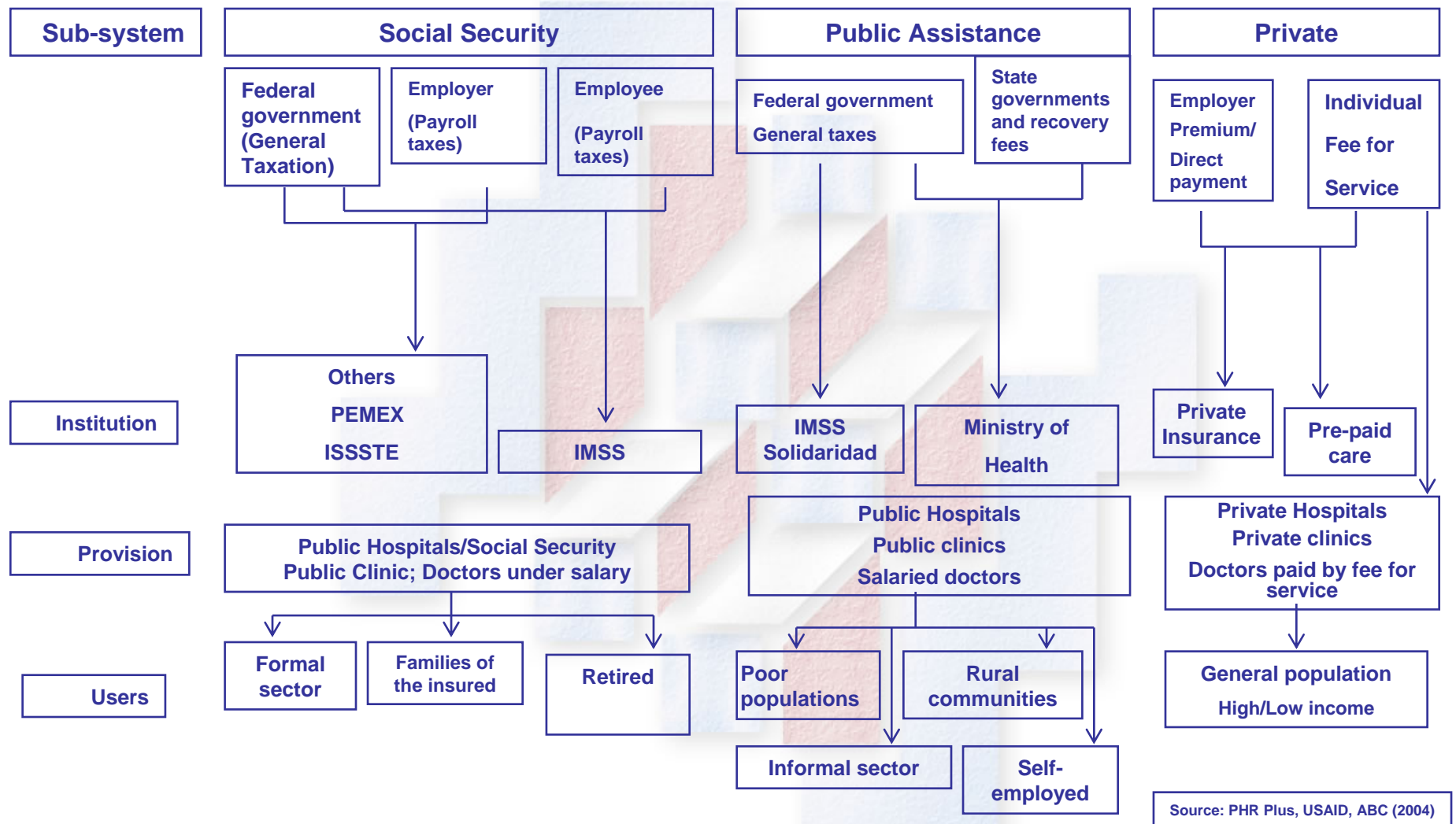
Human Resources: its role in health systems





Health system in Mexico

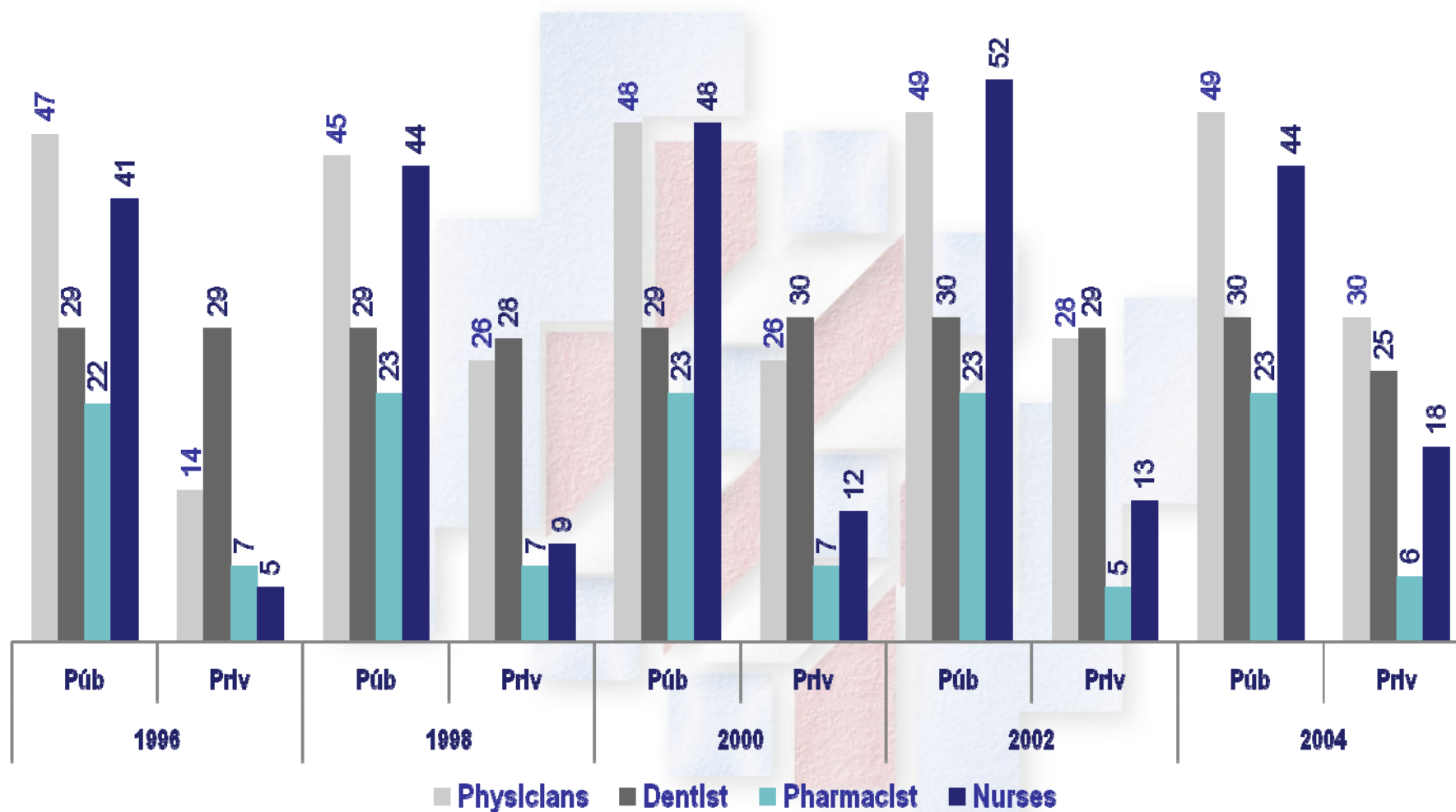
Mexican Health care system structure





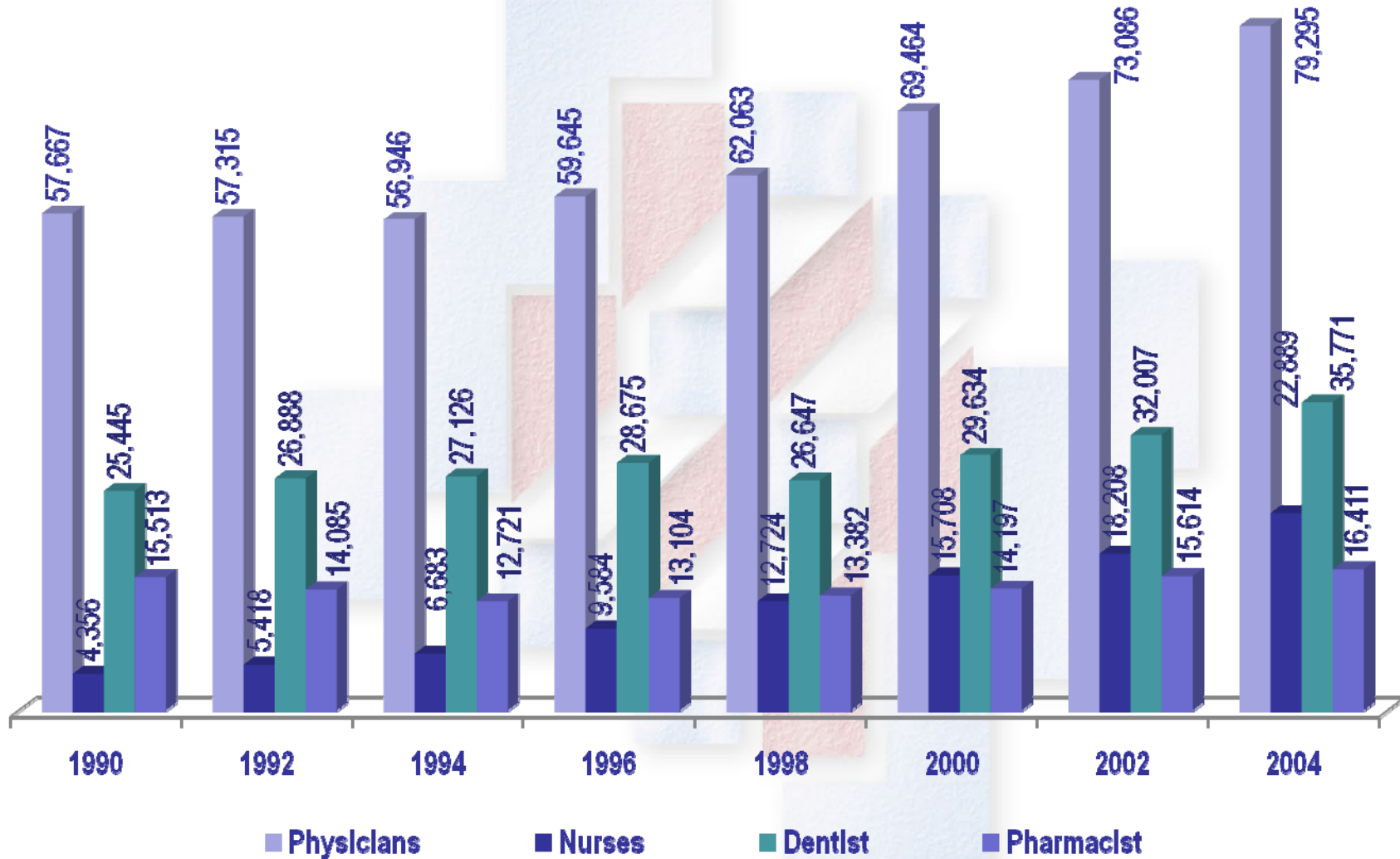
Training Health Workforce

Schools by property status and category, 1996-2004



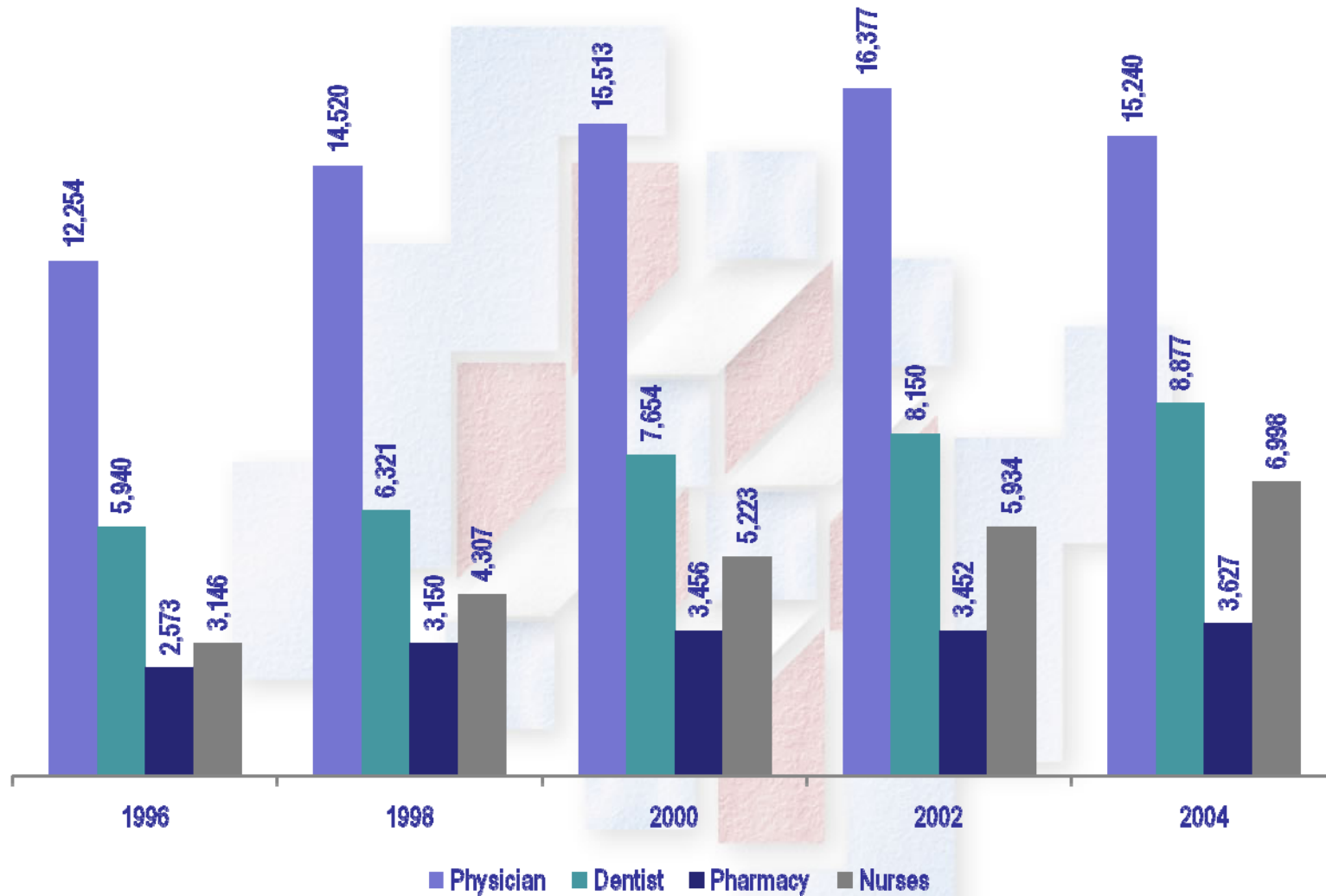
Source: ANUIES. Statistical yearbook 1990-2004.

Total enrollment in four professions, 1996-2004.



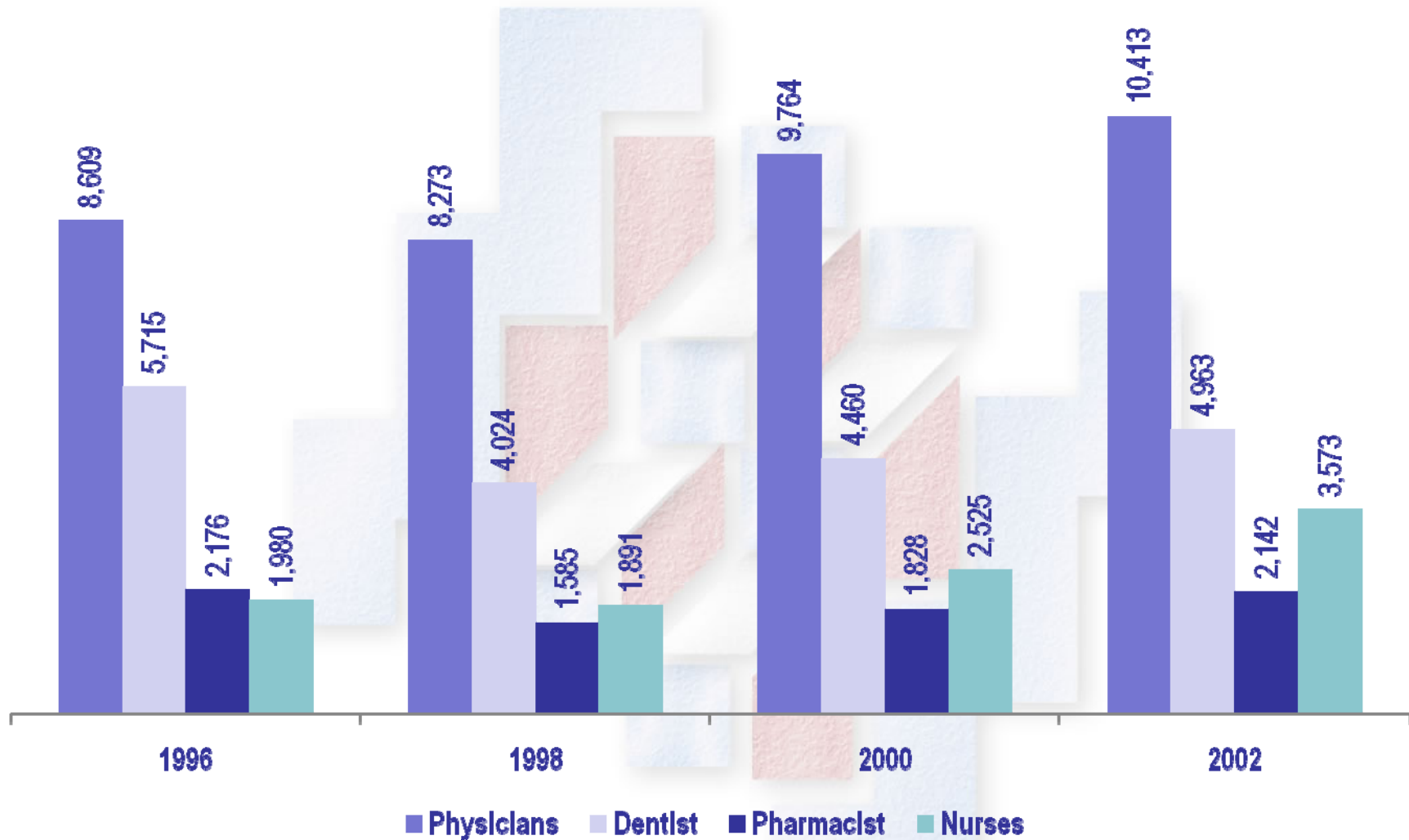
Source: ANUIES. Statistical yearbook 1990-2004.

First enrollment in four professions 1996-2004



Source: ANUIES. Statistical yearbook 1990-2004.

Graduates in four professions, 1996-2002.

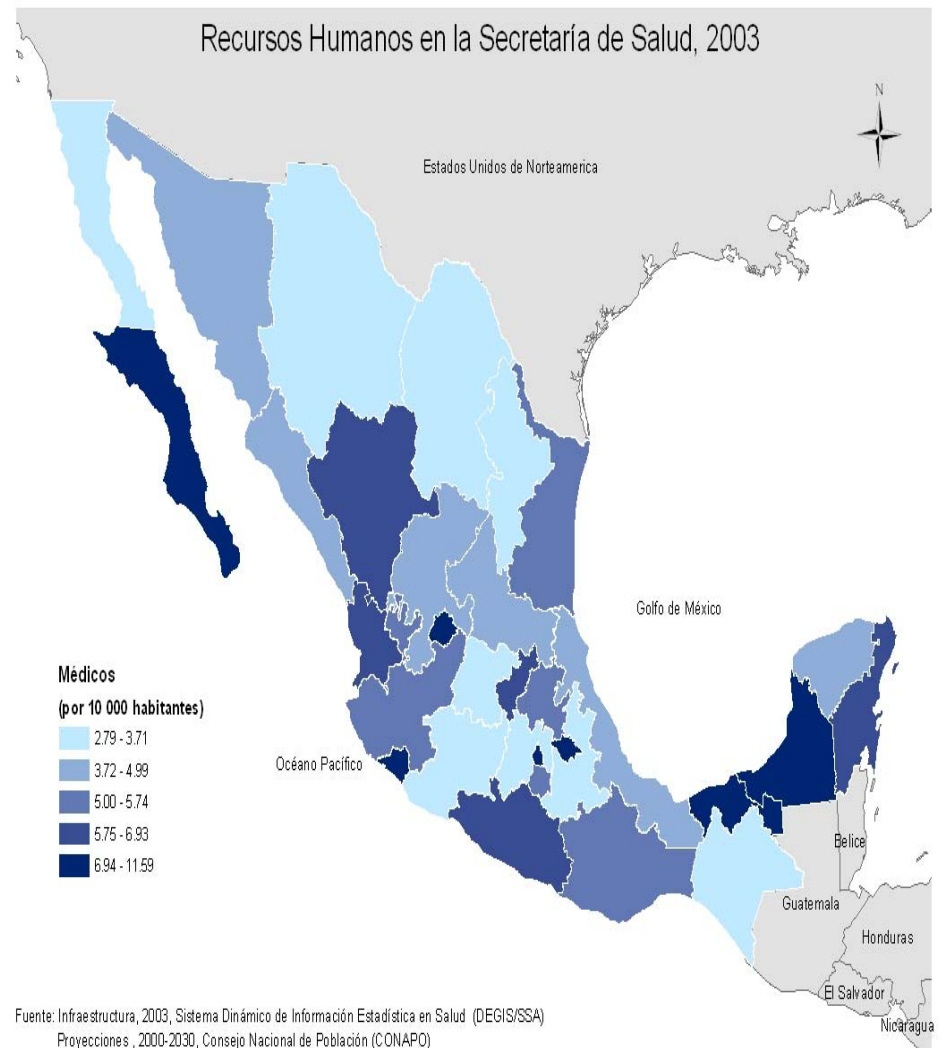
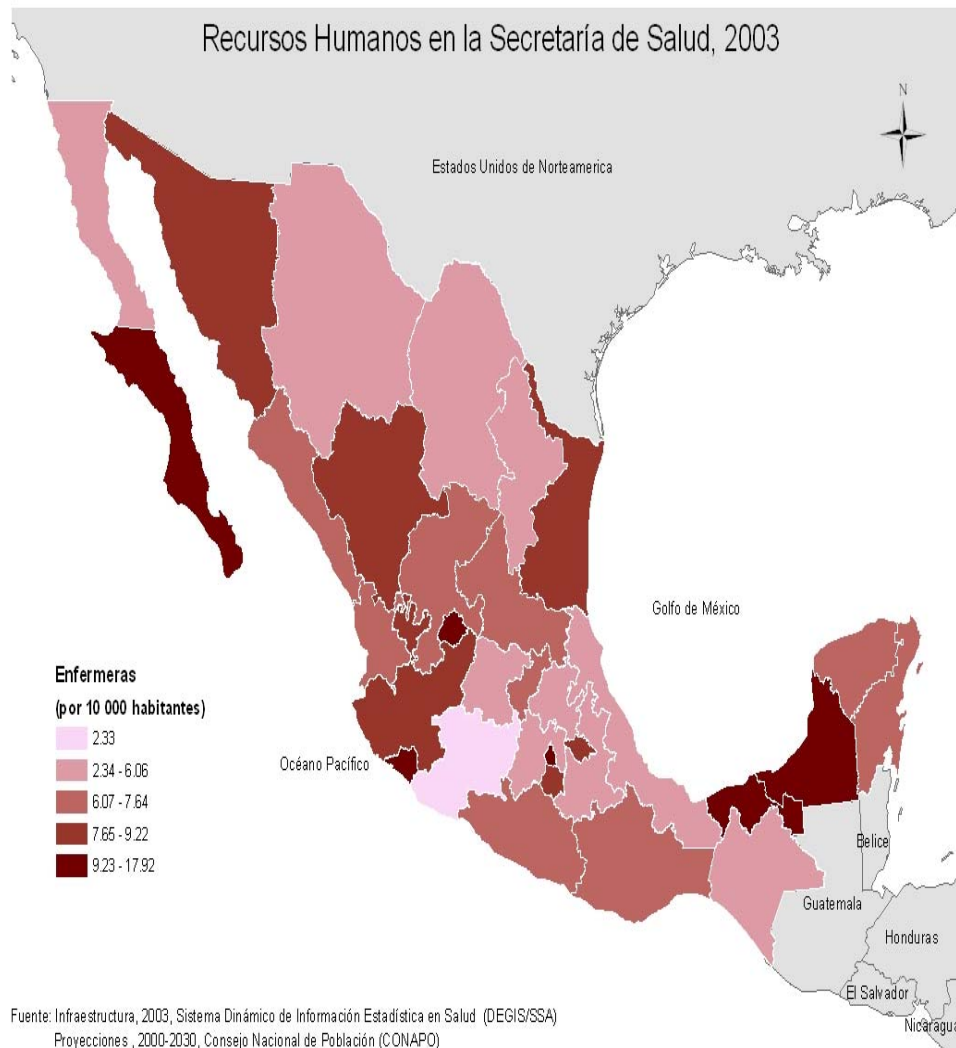


Source ANUIES. Statistical yearbook 1990-2002.

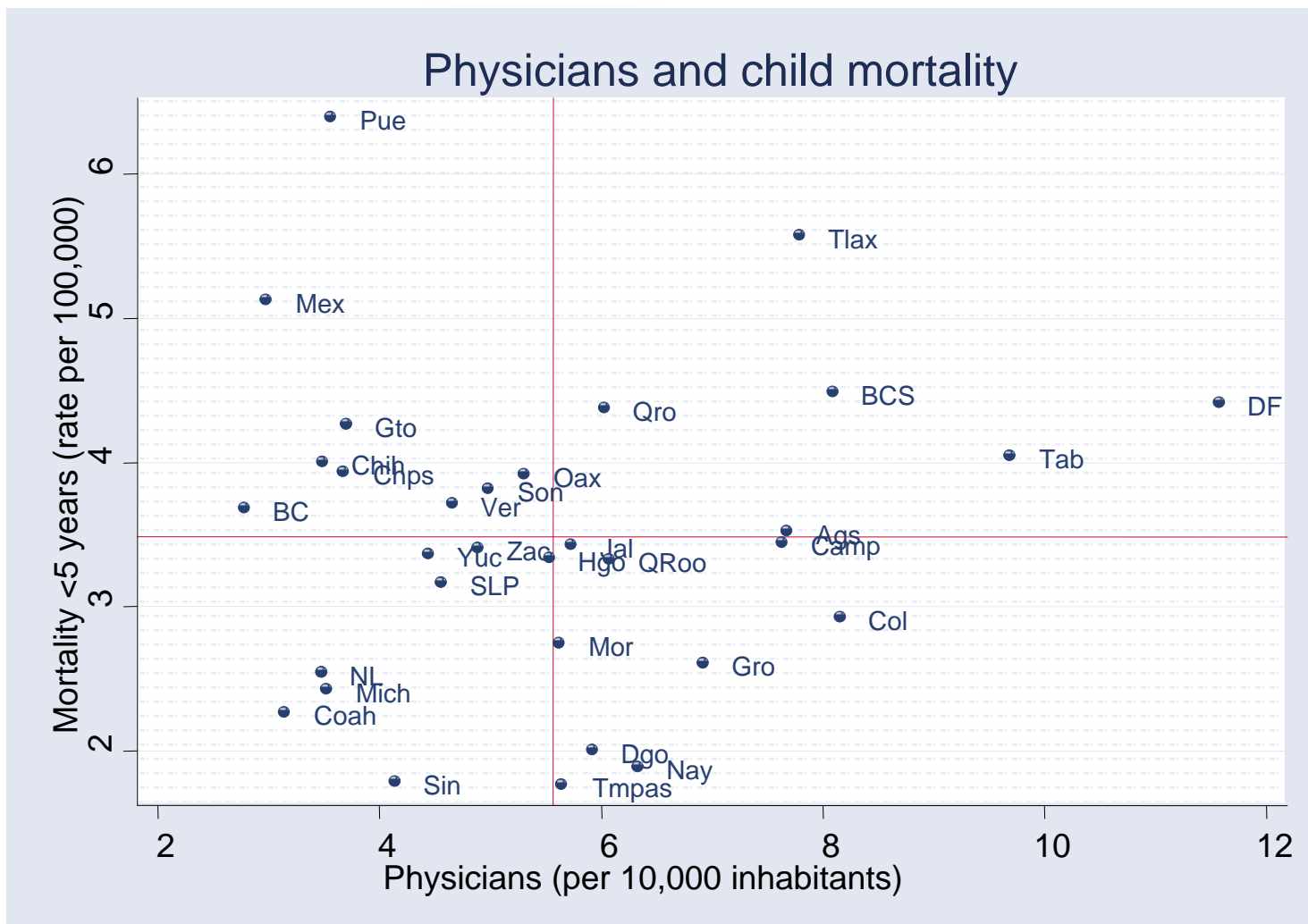


Human resources distribution in México

Nurses and Physicians per 10,000 inhabitants

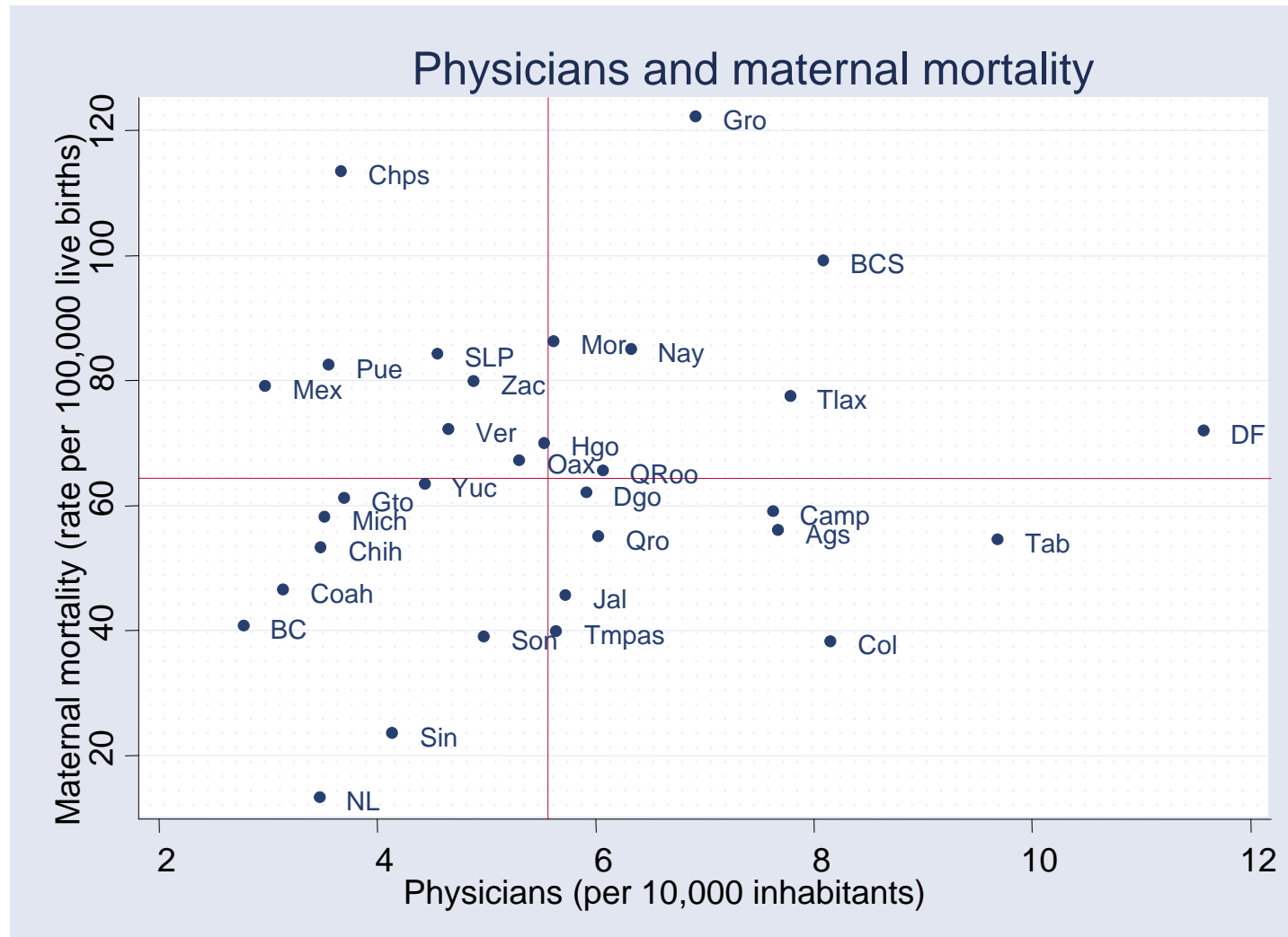


Physicians availability by state vs. child mortality (1)



Source DEGIS/SSA, 2003

Physicians availability by state vs. maternal mortality (2)



Source DEGIS/SSA, 2003



Institutional availability

Total human resources by institution, 2007

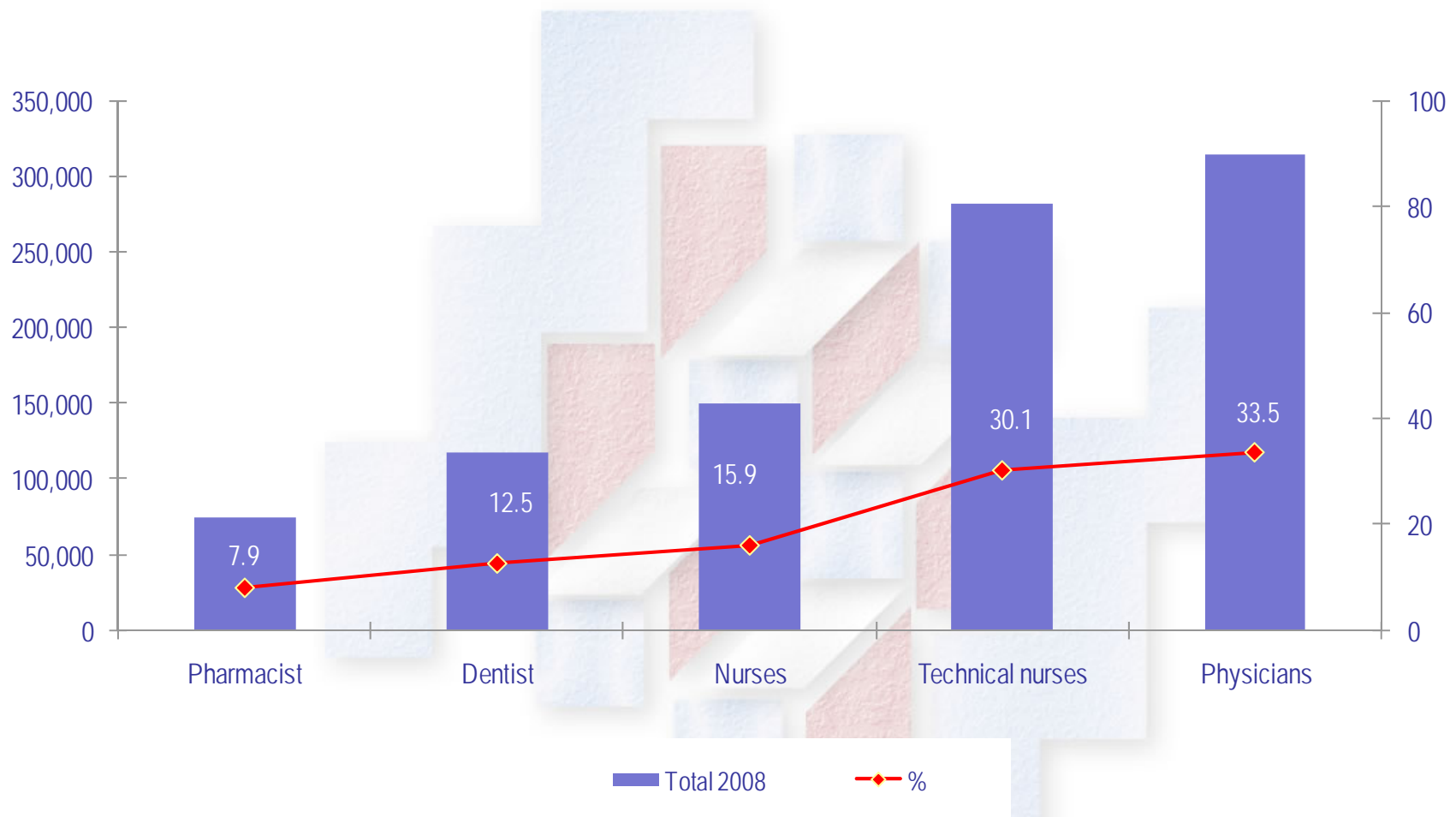
Categories	National total	IMSS	ISSSTE	SSA	IMSS Oport	Other institutions*
Physicians	171,193	63,459	18,695	74 233	5,074	9,732
Nurses	223,081	88,689	21,448	95,343	7,316	10,285
Dentists	7,943	2,032	799	4,538	nd	574
Others **	259,260	126,092	21,082	93,993	3,751	14,342
Total	661,477	280,272	62,024	268,107	16,141	34,933
%	100	42.4	9.4	40.5	2.4	5.3

* Graduates,, Pemex, SEDENA, SEMAR, STC Metro.

** Other medical personnel, Aux Serv Diag and Treatment, others.

Source: SSA, Statistical information bulletin, tome I resources and services, 2007

Total human resources by category, 2008



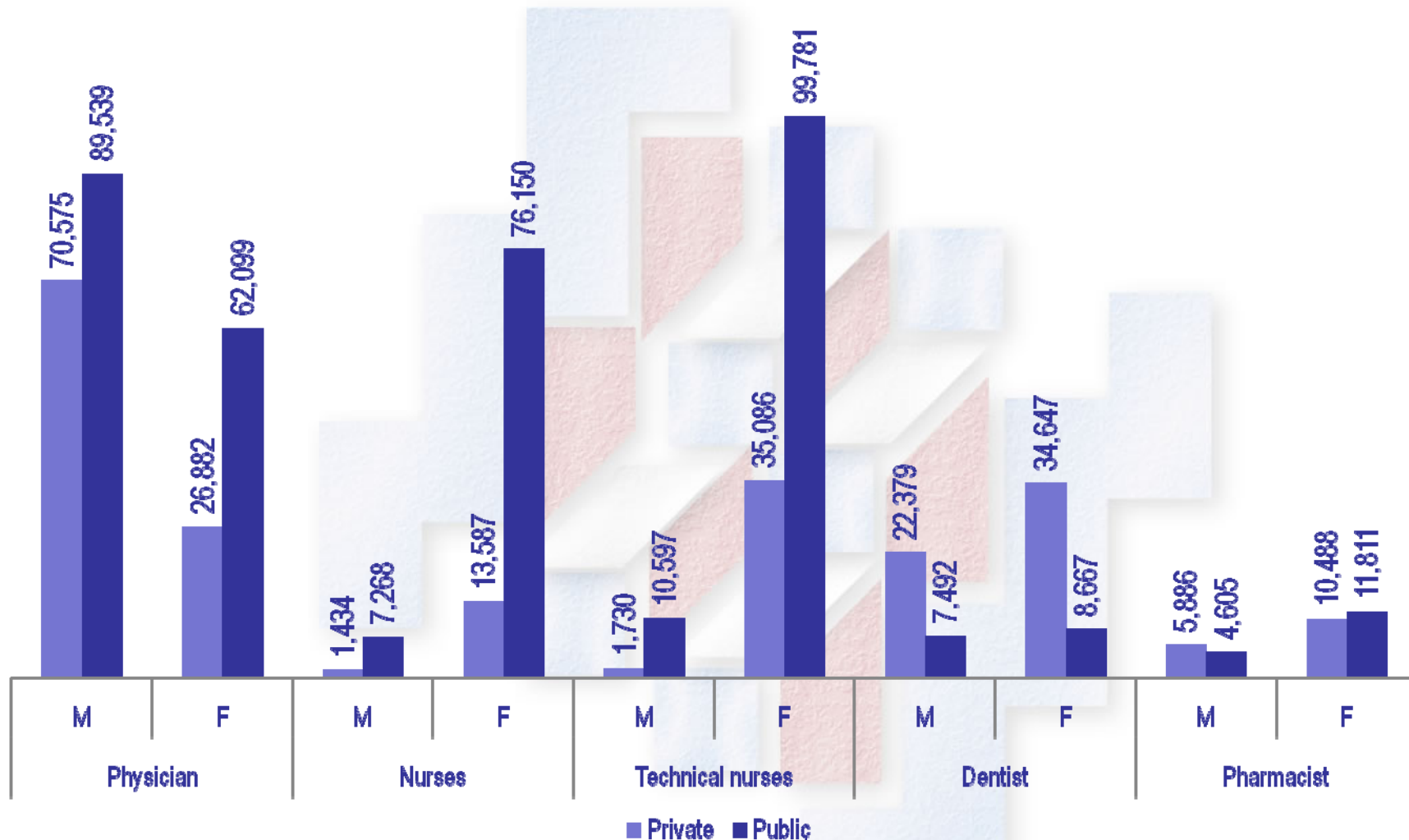
Total HRH (5 occupational groups) = 937,703

Source: INEGI, National Employment Survey, 3rd quarter, 2008.



Labour market

Public – private employment sector by sex, 2008



Source: INEGI, National Occupation and Employment Survey, 3rd quarter, 2008.



Statistical Models

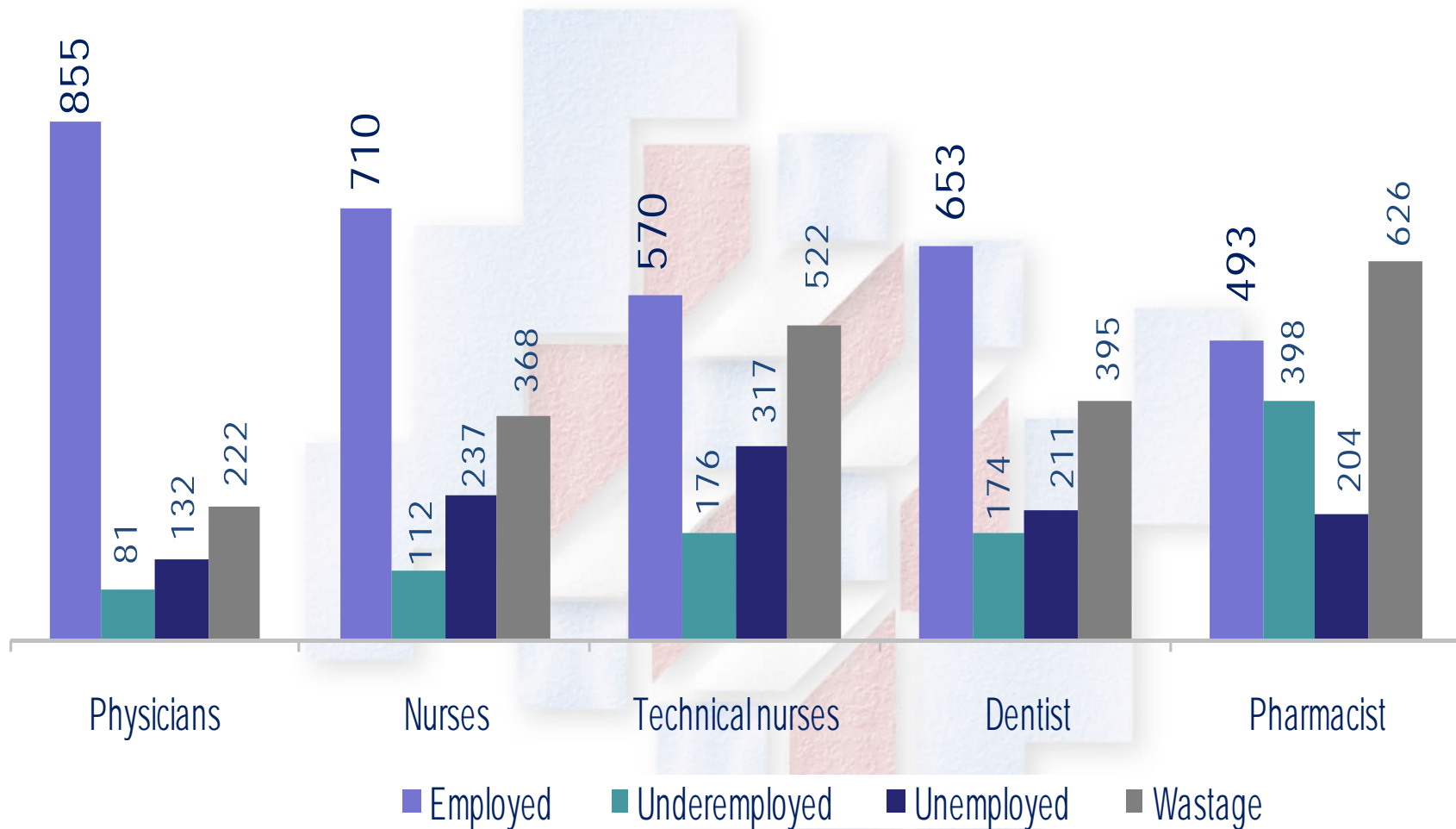
Definitions

- **Employment:** Population performing paid activities. Match between training and labor activities. No students included.
- **Underemployment:** Population performing paid activities. No match between training and labor activities.
- **Not employed:** Population younger than 65 years old not performing paid activities because of market restrictions (unemployed) or personal reasons. No

Source of information

- **National Survey of Employment and Occupation (INEGI)**
- **Provides official information of labor indicators**
- **Panel survey with three-month collection period**
- **National representativeness both urban and rural**
- **120,000 households every three months**

Employed, unemployed, underemployed and labor wastage rates (per 1,000) by occupational category, 2008



Source: INEGI, National Occupation and Employment Survey, 3rd quarter, 2008.

Statistical methods

- **Description of variables**
- **A comparison:**
 - **Dependent variable: wastage condition**
 - **Labor wastage vs. no labor wastage**
 - **X^2 or student t tests.**
- **To explore potential predictors:**
 - **Multiple logistic regression**

Characteristics of health professionals vs wastage / non wastage (1)

Variables	n	Labor wastage (%)	No labor wastage (%)	P value
Sex				
Male	1,184	20.78	79.22	<0.001
Female	1,839	37.09	62.91	
Age (years: median and standard deviation)	3,023	42.33 (11.97)	41.05 (10.65)	0.004
Household role				
Head of household	1,277	22.24	77.76	<0.001
Spouse	913	42.17	57.83	
Other	833	31.09	68.91	
Marital status				
Married	1,925	31.22	68.78	0.609
Divorced	240	31.25	68.75	
Single	858	29.37	70.63	
Number of children				
None	1,011	27.00	73.00	0.001
One	447	27.74	72.26	
Two	799	32.79	67.21	
Three or more	766	25.12	64.88	

Characteristics of health professionals vs wastage / non wastage (2)

Variables	n	Labor wastage (%)	No labor wastage (%)	P value
Migrant				
No	2,123	30.76	69.24	0.912
Yes	900	30.56	69.44	
Size of city or town of residence				
More than 100,000 inhabitants	2,438	31.34	68.66	0.013
Between 15,000 and 99,999 inhabitants	321	23.99	76.01	
Between 2,500 and 14,999 inhabitants	173	29.48	70.52	
Less than 2,500 inhabitants	91	39.56	60.44	
Education				
Undergraduate degree only	2,598	33.26	66.74	<0.001
Postgraduate degree	425	15.06	84.94	
Profession				
Physician	1,380	22.17	77.83	<0.001
Dentist	551	39.75	60.25	
Nurse	758	28.76	71.24	
Pharmaco-biologist-chemist (pharmacist)	334	55.39	44.61	

Predictors of labor wastage among physicians, nurses, dentists and pharmacists in Mexico (1)

Variable	OR	95% CI	
Sex			
Male	1		
Female	1.58	1.20	2.07
Age (years)	0.77	0.72	0.82
Age ² (years)	1.00	1.00	1.01
Household role			
Head of household	1		
Spouse	2.26	1.66	3.07
Other	1.67	1.24	2.26
Marital status			
Married	1		
Divorced	1.29	0.88	1.89
Single	1.25	0.88	1.79
Number of children			
None	1		
One	1.26	0.91	1.74
Two	1.87	1.34	2.61
Three or more	2.09	1.48	2.94

OR: Odds ratios obtained from multiple logistic regression model.

Predictors of labor wastage among physicians, nurses, dentists and pharmacists in Mexico (2)

Variable	OR	95% CI	
Migrant			
No	1		
Yes	1.04	0.86	1.25
Size of city or town of residence			
More than 100,000 inhabitants	1		
Between 15,000 and 99,999 inhabitants	0.67	0.51	0.90
Between 2,500 and 14,999 inhabitants	0.92	0.64	1.32
Less than 2,500 inhabitants	1.48	0.94	2.34
Education			
Undergraduate degree only	1		
Postgraduate degree	0.45	0.33	0.61
Profession			
Physician	1		
Dentist	1.95	1.55	2.46
Nurse	0.85	0.67	1.07
Pharmaco-biologist-chemist (pharmacist)	3.55	2.70	4.65

OR: Odds ratios obtained from multiple logistic regression model.

Localities by population volume and availability of physicians and nurses. Mexico 2007.

Localities according to number of inhabitants	Total Population	Localities		Rates per 10.000 inhabitants		Human Development Index (per state, %)		
		Total	Without Physicians	Physicians	Nurses	Lower tercile	Medium tercile	Upper tercile
<15,000	38,407,255	187,388	175,813 (93.82%)	7.24	7.86	43.44	30.51	26.05
15,000 – 99,999	14,364,335	427	25 (5.85%)	13.92	20.31	30.28	37.24	32.48
>100,000	50,491,798	123	2 (1.63%)	16.05	25.97	15.43	25.93	58.64

Source: Ministry of Health of Mexico. 2007.

United Nations Development Program. Human Development Report. México 2006-2007. México DF: UNDP; 2007.



Conclusions

Conclusions (1)

- In Mexico HRH imbalances were identified almost 30 years ago, policies have been established but to a large extent the same problems persist, particularly the inability to have coordinated plans between trainers and employers.
- Unlike other professions, medical programmes follow a cyclic pattern of development in the training of students. Enrollment has recently been on the decrease. The rest of the groups are increasing steadily their enrollment.
- There is a significant production of human resources that imply an important social investment that is being wasted due to unemployment and underemployment.
- It is key to generate more information about human resources for health at country level, both in health institutions and universities aiming at the implementation of strategic plans for their development.

Conclusions (2)

- **Profile of wastage in Mexico:**
 - **Women with two or more children, very young or elder, undergraduate attainment, dentist or pharmacist, and living in big or small municipalities.**
- **Consistency with other studies**
- **Women and unemployment (Williams, 1969):**
 - **In Mexico (Frenk 1999; Nigenda, 2005/2006).**
 - **Other countries: UK (Timbury, 1969; Wakeford, 1989; McKeigue, 1990; Rhodes, 1990), and Norway (Gjerberg, 2003).**

Conclusions (4)

- **Child bearing and unemployment (work or home?):**
 - UK (Timbury, 1969; Rhodes, 1990; Goldacre, 2001; Sinden, 2003), Norway (Gjerberg, 2003)
- **Age and unemployment:**
 - UK (Goldacre, 2001).
- **Postgraduate studies and unemployment:**
 - Croacia (Bagat, 2006).

Conclusions (3)

- **Limitations**
- **Problems with measurement of wastage status (specially among pharmacists).**
- **Few variables explored (depending of data availability).**
- **(Historically) low importance of research on human resources for health.**