

## ORTHOPAEDICS

### Puerto Rico Orthopaedic Manpower Study

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**ABSTRACT.** Data regarding orthopaedic work-force is presented. Data is based on information obtained from the Puerto Rico Board of Medical Examiners, the Puerto Rico Department of Health and orthopaedic surgeon's practice. The purpose of this study is to compare the local orthopaedic manpower

with the American Academy of Orthopaedic Surgeons most recent national manpower survey and to provide a database of the local orthopaedic work-force. **Keywords:** *Manpower, Orthopaedic, Puerto Rico, Work-force*

The health care environment is changing at an alarming pace, radical changes in the economics of medicine have prompted medical schools and residency training programs to change the focus of medical education and the amount of physicians trained in all medical specialties. In order to meet the requirements associated with the surge of managed care medicine, the ratio of primary medicine-to-specialists is being reevaluated.

Numerous manpower studies are conducted in the continental United States. The American Academy of Orthopaedic Surgeons (AAOS) has collected manpower data on a regular basis for more than two decades. We have the impression that the findings at the national level do not necessarily apply to our local reality although no data of the local orthopaedic work-force is available. The purpose of this study is to collect data on the local orthopaedic work-force that may be used in making informed decisions by the governing forces in our medical society.

#### Materials and Methods

The archives of the Department of Orthopaedic Surgery of the University of Puerto Rico School of Medicine and the Section of Orthopaedic and Fracture Surgery of the Puerto Rico Medical Association were reviewed and a questionnaire was sent to all active orthopaedic surgeons

in Puerto Rico. After excluding all retired orthopaedic surgeons a total of eighty six active orthopaedic surgeons were identified. The questionnaire was used to obtain information about the orthopaedic surgeons' age, office and hospital practice, hours per week dedicated to the practice, residency program attended, fellowship training, years in practice, American Board of Orthopaedic Surgeons certification, practice profile and patient profile.

The practice profile was divided in two major areas. The first one refers to the time of practice dedicated to the following areas: private practice, Puerto Rico government hospitals, Workmans Compensation Fund, Administration for Compensation of Automobile Accidents (ACAA), federal government hospitals, medical administration, teaching, research and medicolegal evaluations. The second area refers to the time invested in different areas of orthopaedics and time devoted to office orthopaedics. These values are all expressed in percentages. The patient profile seen in a private office is described as the private office distribution by payer or insurance carrier, such as Blue Cross, Triple S (SSS) of Puerto Rico, Medicare, Workmans Compensation, ACAA, Puerto Rico Health Care Reform, private insurance companies and government sponsored patients. These values are also expressed as percentages.

Additional information, such as the Puerto Rico vital statistics and physician distribution among surgical specialties was obtained from the Puerto Rico Department of Health and Puerto Rico Board of Medical Examiners. In addition to the variables present in the questionnaire, orthopaedic surgeons were distributed among Puerto Rico Health Regions and Sub-regions based on their office and/or primary hospital setting.

The 1994 American Academy of Orthopaedic Surgeons

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survey among the continental USA orthopaedic surgeons and the Factbook of Surgery from the American College of Surgeons were used for data analysis and comparison. Data obtained from the questionnaires was analyzed with the Centers for Disease Control statistics program Epi-Info.

## Results

**Surgical specialties.** There are 8,796 physicians in Puerto Rico and 1,141 (13%) of them are surgeons. The total number of surgeons includes 226 general surgeons (19.8%), 421 obstetricians and gynecologists (36.9%) and 494 subspecialized surgeons (43.3%). Orthopaedic surgeons account for 7.5% of the surgeons in Puerto Rico and for 17.4% of the subspecialized surgeons (1,2) as shown in figure 1.

**Distribution by age.** The age distribution of orthopaedic

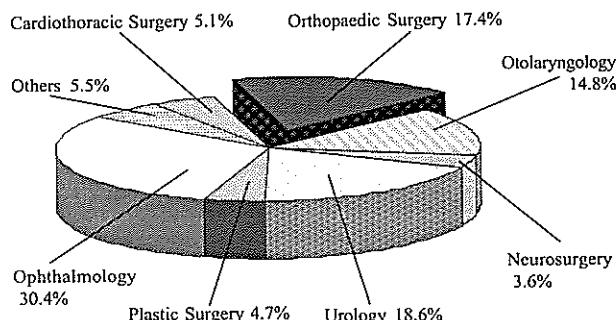


Figure 1. Surgical Subspecialties

surgeons is shown in figure 2. Twenty nine (34.1%) orthopaedic surgeons are between 30 and 39 years old, twenty two (25.8%) are between 40 and 49 years old and the third group (50-59 years) is composed of twenty one

### Age in Years

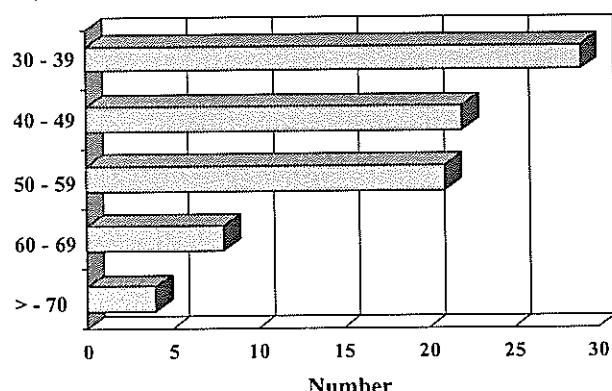


Figure 2. Age Distribution

(24.7%) orthopaedists. Eight (9.5%) surgeons are between 60 and 69 years of age, four (4.8%) senior orthopaedic surgeons are more than 70 years old of age and one (1.2%) did not answer the question. The minimum age among those who answered this question is thirty two years and the eldest is seventy four years. The mean age is forty seven years, with a standard deviation of 11.231, the most frequent age is thirty six years.

**Practice in hours per week.** The data collected on hours per week dedicated to the practice of orthopaedics (n=85) is presented in figure 3. This information was divided in groups; the first group included those orthopaedic surgeons working less than forty hours per week, nine (10.6%) are in this group. The orthopaedists in this group were considered

### Hours

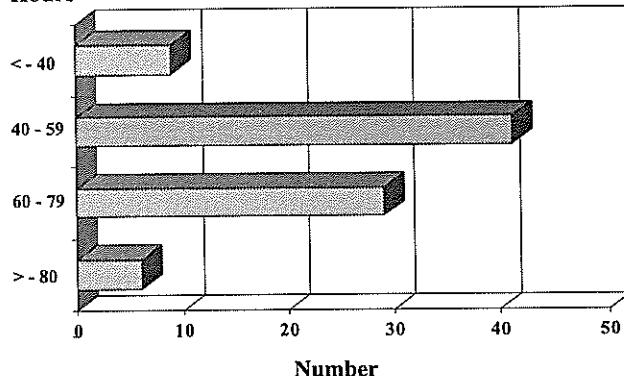


Figure 3. Practice in Hours Per Week

to be engaged in part-time practice of orthopaedic surgery. Within this group, six (7.1%) dedicate all of their time to the practice of office orthopaedics (do not perform surgery). Forty one (48.3%) orthopaedists reported working forty to fifty nine hours per week. Most active orthopaedic surgeons belong to this group and one of them is devoted to full time administrative practice. Twenty nine (34.1%) report working from sixty to seventy nine hours per week and six (7%) inform working more than eighty hours per week. The minimum total of hours in a week devoted to the practice of orthopaedics by an orthopaedist was fourteen hours, the maximum 105 hours and the average (mean) was fifty two hours per week, with a standard deviation of 15.944.

**Residency training.** Orthopaedic surgeons (n=85) participating in this study completed residency programs in the continental United States or the University of Puerto Rico School of Medicine. Sixty one (71.8%) orthopaedic surgeons attended the University of Puerto Rico program and twenty four (28.2%) attended programs in the continental United States.

**Specialization within orthopaedic surgeons.** The number

of orthopaedic surgeons dedicated to the practice of general orthopaedics is fifty, representing 58.8% of the total. The other thirty five (41.2%) are subspecialists and received formal fellowship training (Figure 4). Sixteen of those thirty five completed a six month fellowship training and nineteen completed a one year fellowship training. Puerto Rico has a higher percentage of specialists when compared to the percentage of specialized orthopaedic surgeons in United

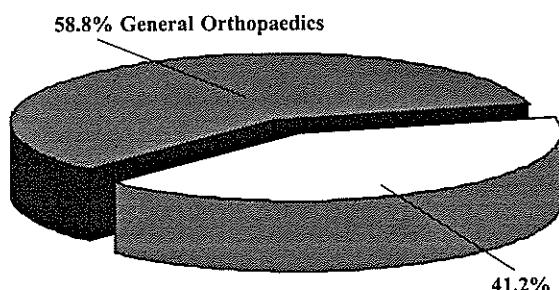


Figure 4. Specialization Within Orthopaedic Surgery

States which is 25.6% (3).

**Fellowship distribution within specialists.** The most frequent fellowship program completed is pediatric orthopaedics with a total of nine surgeons, which account for 26.5% of all orthopaedists with formal fellowship training. Reconstructive surgery (4 orthopaedists) and joint replacement (4 orthopaedists) are the second two most frequent fellowship completed, for an 11.8% respectively. Fellowship distribution within orthopaedic surgeons in Puerto Rico is illustrated in figure 5.

**Board certification among orthopaedists.** Thirty three

#### Fellowship

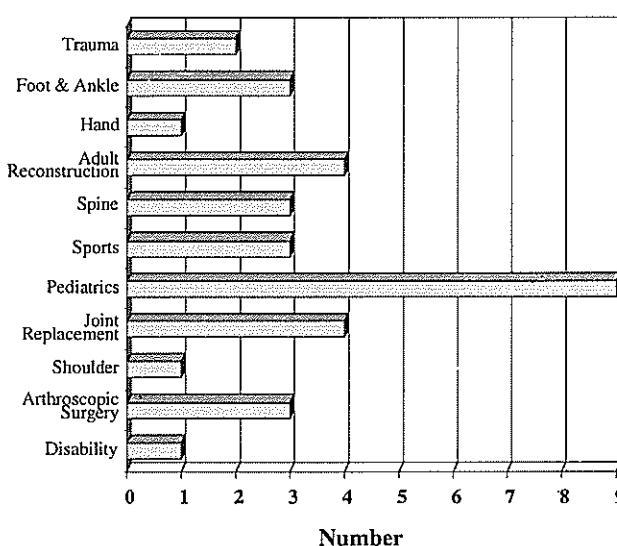


Figure 5. Fellowship Distribution Among Orthopaedic Specialists

(38.7%) orthopaedic surgeons of the eighty five participating in this study are board certified and fifty two (61.2%) are non-certified. (Figure 6). Since 1986, 80% of the residents of the University of Puerto Rico orthopaedic surgery program have completed the first part of the board certification exams and forty six percent of these have completed both parts.

**Current practice status.** Private practice is the area in which ninety three percent of orthopaedic surgeons dedicate their time. Only 24.7%, of the total are engaged in full time private practice and forty one percent dedicate

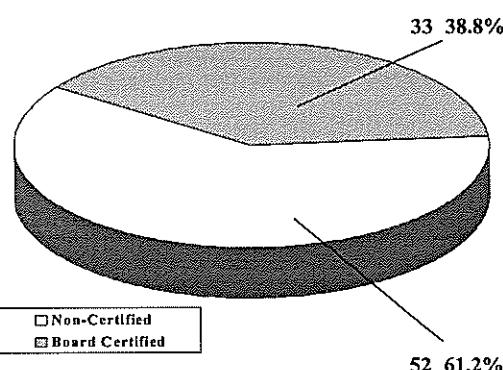


Figure 6. Board Certification

some time of their practice to Puerto Rico government hospitals. Only 4.7% of orthopaedic surgeons dedicate some time of their practice to federal government hospitals. Approximately seven percent of orthopaedic surgeons dedicate some time of their practice to administration or research. In the AAOS 1994 national survey, administration and research areas accounted for 8.1% and 8.09% of orthopaedists respectively. The percentage of orthopaedic surgeons who dedicate time to teaching (28.2%) is approximately twice the percentage of orthopaedists devoted to teaching in the AAOS 1994 survey report (14.3%). Figure 7 shows a distribution of all the areas in which orthopaedic surgeons dedicate their time.

**Surgical practice per anatomical area.** Eighty one percent of orthopaedists devote some of their time to trauma surgery. Sixty two percent to shoulder surgery and 12.9% to tumor and spine surgery. Complete surgical practice distribution is presented in figure 8.

**Private practice profile.** Patients with Triple S Medical Insurance, a Preferred Provider Organization (PPO), are seen by 85% of orthopaedic surgeons in their private practice. Patients with Medicare are seen by 81% and those with Blue Cross (PPO) are seen by 74.1% of orthopaedists. Only 9.4% of orthopaedists have patients from the Puerto Rico Health Reform in their private practice. Figure 9 demonstrates the patient profile seen in private practice.

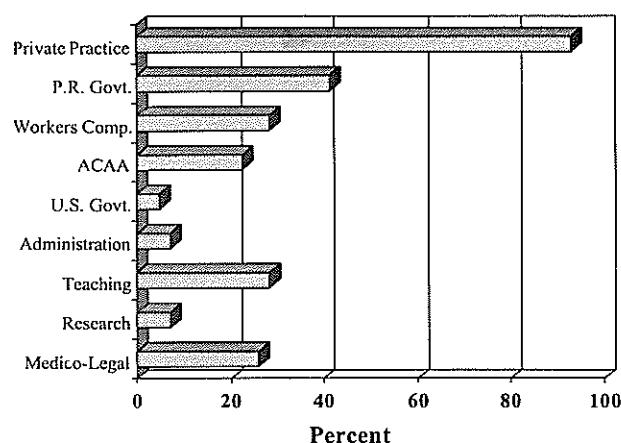


Figure 7. Current Practice Status

*Private practice distribution by payer.* Twenty one percent of patients are Triple S pay, while 20% are Medicare, 19% are private insurance company pay and

#### Type of Surgery

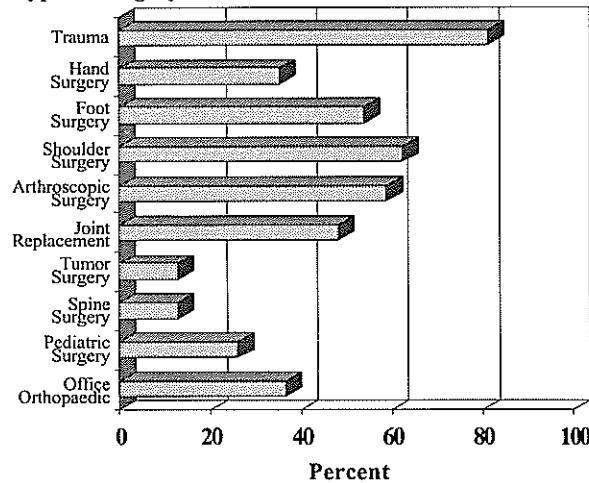


Figure 8. Surgical Practice Distribution Per Anatomic Area

13.7% are Blue Cross pay. Less than one percent (0.9%) of patients are Puerto Rico Health Reform pay. Figure 10 describes practice distribution by insurance carriers.

*Orthopaedic surgeons by health region.* The Puerto Rico Health Care System is divided in six Health Regions and three Sub-regions as shown in figure 11. The number of orthopaedic surgeons vary widely among areas (Table 1). The San Juan Metropolitan Region has the greatest number of orthopaedic surgeons per 100,000 resident population (density=4.65) followed by Sub-region II (Humacao) with 3.14 orthopaedic surgeons per 100,000 habitants. Density of orthopaedic surgeons is lowest in Sub-region I (Fajardo) where no orthopaedic surgeon has

his primary practice setting. The average of orthopaedic surgeons per 100,000 habitants is 2.37. This average density

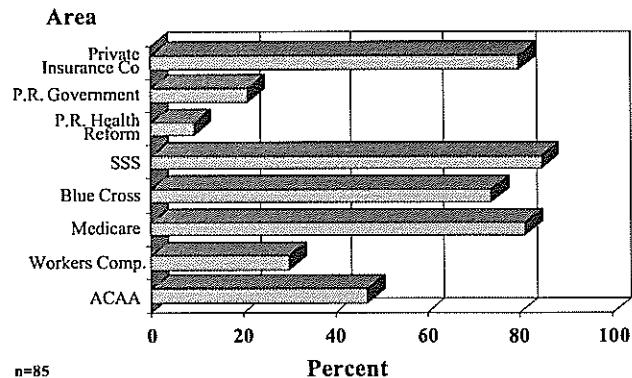


Figure 8. Private Practice Profile

is lower than the national average density of orthopaedic surgeons per 100,000 resident population, which is 5.59 (3). The state with minimum density, West Virginia, has 3.69 (3), a higher density than any Health Region in Puerto Rico except for the San Juan Metropolitan Region.

Table 1. Orthopaedic Surgeons Distribution and Density

| Health Region              | Number of Orthopaedic Surgeons | Population (%)  | Density* |
|----------------------------|--------------------------------|-----------------|----------|
| North                      | 6                              | 419,651 (11.6)  | 1.42     |
| Northeast                  | 13                             | 598,195 (16.5)  | 2.17     |
| East                       | 8                              | 370,692 (10.2)  | 2.15     |
| Metropolitan               | 40                             | 859,287 (23.7)  | 4.65     |
| South                      | 7                              | 575,044 (15.9)  | 1.21     |
| West                       | 5                              | 296,279 (8.2)   | 1.68     |
| Sub-region I (Fajardo)     | 0                              | 131,533 (3.6)   | 0        |
| Sub-region II (Humacao)    | 5                              | 158,916 (4.4)   | 3.14     |
| Sub-region III (Aguadilla) | 2                              | 211,941 (5.9)   | 0.94     |
| Puerto Rico (Total)        | 86                             | 3,621,538 (100) | 2.37     |

\* Active orthopaedic surgeons per 100,000 resident population  
Population estimates derived from 1993 Puerto Rico Health Department Vital Statistics Reports

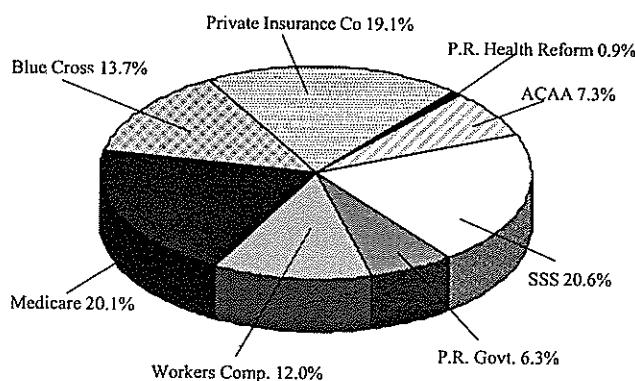
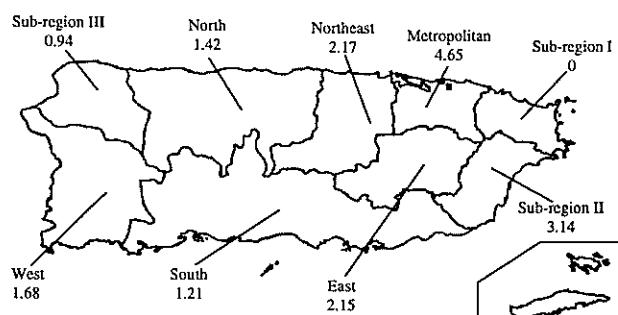


Figure 10. Private Practice Distribution by Payer



\* Number of Orthopaedic Surgeons Per 100,000 Resident Population

Figure 11. Density of Orthopaedic Surgeons by Health Region

## Conclusion

An analysis of the orthopaedic work-force in Puerto Rico is presented. This data is made available in order that informed decisions regarding orthopaedics can be made. We urge other medical specialties to analyze their work-force in a similar fashion.

## Resumen

Presentamos data relacionada a la fuerza laboral de ortopedas en Puerto Rico. La data es basada en información obtenida del Departamento de Salud de Puerto Rico, del Tribunal Examinador de Médicos de Puerto Rico, y de la práctica de los ortopedas en Puerto Rico.

Este estudio pretende comparar la fuerza laboral de ortopedas a nivel local con la más reciente encuesta nacional de la Academia Americana de Cirujanos Ortopedas y proveer una fuente de información sobre la fuerza laboral de ortopedas en Puerto Rico.

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