



Using financial incentives to attract medical residents to the periphery: The Israeli experience

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ARTICLE INFO

Article history:

Received 24 January 2018

Received in revised form 4 October 2018

Accepted 6 October 2018

Keywords:

Physicians

Periphery

Incentives

Israel

ABSTRACT

Background: In 2011, Israel instituted financial incentives as part of a larger program to attract doctors to residency programs in peripheral hospitals.

Objective: To explore the impact of these incentives and related changes on the choices of locations for residency training in Israel.

Methods: We performed (A) an analysis of administrative data on the location of all new medical residencies in 2005–2014 (B) an internet/phone survey of residents who began specialty training in 2013–2014, with a response rate of 71%.

Results: (A) Of all entrants to residency training programs in Israel, those in peripheral hospitals constituted 16–20% in 2005–2010, 19% in 2011, 23% in 2012, and 23% in 2013; the increase consisted predominantly of physicians who were graduates of non-Israeli medical schools (B) About half of all residents in the periphery reported that the incentives contributed to their choice of residency location. About 40% of that group also reported that they had planned already in medical school to practice in the periphery, while 60% of that group (30% of all residents in the periphery) did not have such plans prior to medical school. About 70% of the residents in peripheral hospitals grew up in the periphery; for the southern periphery this was 40% and for the northern periphery this was 80%.

Conclusions: The changes instituted in 2011 apparently affected residency location preferences for a non-negligible proportion of young physicians, particularly among those who grew up in the periphery. Policymakers should consider combining targeted incentives with measures to increase the supply of physicians who grew up in the periphery.

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1. Background

Many countries around the world face the problem of uneven geographical distribution of physicians. Physicians tend to concentrate in large cities and central regions and are less available in rural and peripheral areas [1–5]. In a recent survey in 34 OECD countries, all but one country noted the imbalance in geographical distribution as a major policy problem [5]. The shortage of doctors in the periphery has been linked to problems of access to health care and to poorer health outcomes in these areas, which are generally weaker socioeconomically. Unequal distribution of physicians can be the result of difficulty in recruiting doctors to work in certain areas, and / or retaining those working there.

This paper begins with a brief review of the literature on the factors influencing physician location decisions. It then presents

an in-depth assessment of a recent effort in Israel to use economic incentives to attract more young physicians to the periphery. While focusing on the influence of these new economic incentives, the empirical study also considers the roles in Israel of other influences on location decision that are prominent in the international literature. The paper concludes with a consideration of lessons that other countries might draw from the Israeli experience at the levels of policy, concepts and study methods.

2. The literature on physician location decisions

The main influences discussed in the literature can be grouped into: socio-economic background, experience during medical studies, values and personal/cultural preferences, and economic influences. As indicated below, the literature on this subject is primarily descriptive and cross-sectional in nature, though there have also been some evaluations of interventions.

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2.1. The physicians' personal backgrounds

Several of the physician's background variables have been found to be associated with residency training in peripheral areas. The most influential variable in this context, about which there is a fairly broad consensus in the literature, is growing up in, or being born in, a peripheral area [6–10]. The more years a physician has lived in a peripheral region and the more he/she identifies as having a peripheral background, his/her tendency to work as a physician in a peripheral region will be greater [11,12]. Similarly, the geographic background of the physician's spouse influences the choice of the work area [7,13]. The connection between a peripheral background and work in a peripheral region as a physician has been found for both family physicians and specialists [11].

2.2. Experiences during the course of studies

Another factor influencing the decision to move to a peripheral region is the students' experiences during their medical studies. Medical education is an opportunity to expose future doctors to the advantages and challenges of working in the periphery. For example, in peripheral areas in the United States there are medical schools specializing in care specifically for such areas. These schools operate programs designed to recruit and train doctors to work in peripheral areas, and are often located in the periphery. Studies have found that students who study in these programs are more likely to work in peripheral areas at the end of school [14,15]. Similarly, founding a medical school in northern Norway was found to increase the supply of doctors in that area [16,17]. At the same time, one must refrain from concluding that there is a causal connection, since there is a component of self-selection here; it is possible that those who choose to study in these programs in the first place are more likely to prefer to work in a peripheral region.

An attempt to bring more physicians to the northern periphery in Israel by opening a new medical school in the northern district in 2011 seems to have had limited success to date. Although no formal data have been published, reports in the press indicate that almost all of the graduates have left the area and are doing their residency programs in the center of the country.

Another way to expose students to work in peripheral areas is through rotations during studies. This approach does not require channeling at the entrance to medical school, but rather by exposing students in regular medical schools to work in peripheral areas. Studies have found that this exposure increases the likelihood of selecting work in a peripheral region at the end of school, either permanently or temporarily [9,15]. Another study found that physicians from urban backgrounds working in peripheral areas tended to point to their experiences in peripheral areas during study or residency training as an important factor in the decision [18].

2.3. Values and personal preferences

The doctor's personal and cultural preferences are also important in choosing the work location at the end of the studies. For example, studies have found that students who report at the beginning of their studies that they intend to work in peripheral areas are more likely to realize these intentions [7,15]. In addition, physicians drawn to the lifestyles available in peripheral areas are more likely to work in these areas [7,18].

2.4. Economic considerations

Studies examining the preferences of young students and doctors as to what will attract them to the periphery or leave them there have found that factors such as control over their working hours, provisions for vacations, and the ability to develop profes-

sionally were more important to them than economic incentives [19,20].

2.5. Intervention studies

Countries have engaged in a variety of strategies to increase the number of physicians in the periphery, including selection, education, coercion, incentives and support [4]. Verma et al. [21] systematically reviewed a wide range of intervention types and found that "weak evidence supported the use of postgraduate placements in underserved areas, undergraduate rural placements and recruiting students to medical school from rural areas. There was mixed evidence about financial incentives."

Strategies often include salary incentives of some kind, sometimes accompanied by improvements in working conditions, such as student scholarships, repayment of loans to young doctors in return for a commitment to work in a particular area, or one-time or periodic financial grants. Few studies have examined the effectiveness of these programs for the long term; for programs that were accompanied by evaluation, the results have been mixed. One recent review of the literature [5] concluded that "from the limited available evidence, it appears that financial incentives may be more effective in channeling money to physicians in underserved regions, but less effective at attracting new recruits to these areas".

We were unable to find any large-scale studies that examined whether the impact of financial incentives was related to previous exposure to the periphery and/or training abroad.

3. The Israeli case

Distances in Israel are small compared to many other countries (with the full length of country being 263 miles) and transportation facilities are quite good in most areas of the country. Nonetheless, among Israelis there is a clear sense of distinction between periphery and center. The center is densely populated, mostly Jewish and urban or semi-urban. Cost of living (mainly housing) is higher in the center, as are salaries. In the center, there are also more job opportunities in both the medical and non-medical sectors, and the population on average is more affluent. All of the major large hospitals except one are in the center. The periphery consists mainly of towns and smaller local authorities, some of them agricultural. The south and the north are geographically different from one other – the southern district covers a very large area, most of which is desert and sparsely populated, and has one large city with one of the largest hospitals in the country. The northern district is smaller geographically, with shorter distances between towns, and no major cities. Over half the population in this district belong to the Arab minority.

Like many other countries, Israel has to contend with the problem of unequal geographic distribution of physicians, with a substantially higher rate of physicians per capita in the center of the country than in the periphery [22]. In 2009–11 the number of MDs per 1000 population was 4.5 in the Tel Aviv region, but only 2.8 in the South and 1.7 in the North.

This problem has been on the health policy agenda for many years [29,23], during which time various solutions have been proposed. In 2011, the physicians and employers signed a new collective agreement that will remain in force until 2019. It contains clauses designed to respond to two staffing problems: the shortage in the periphery and a nation-wide shortage of physicians in certain specialties ("specialties in crisis"). The agreement established incentives to attract specialists and new residents to specialties in crisis and to hospitals in (or near) peripheral areas [24]. The incen-

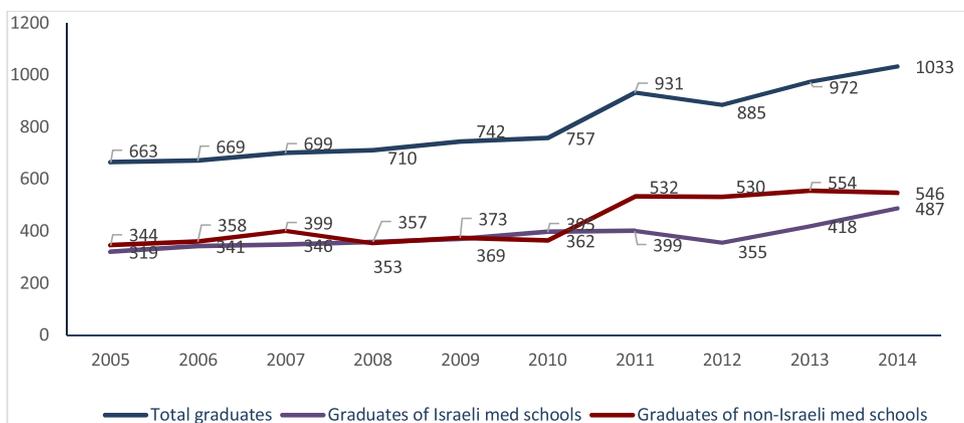


Chart 1. New residencies by year and place of study (N).

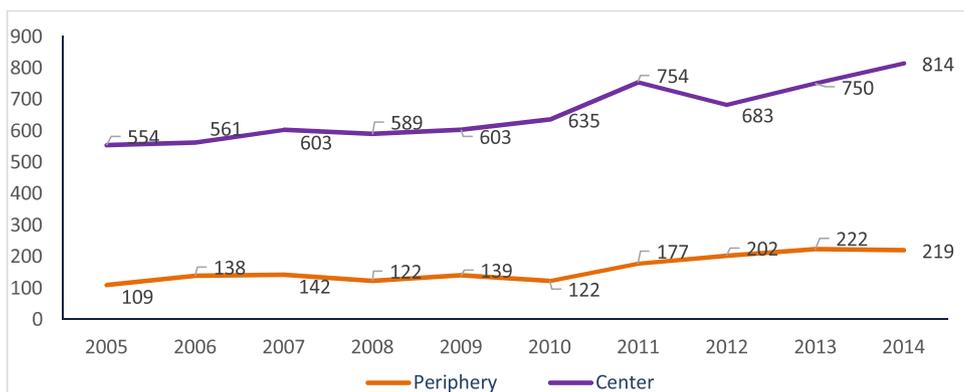


Chart 2. New residencies in the periphery and in the center (N).

tives include one-time grants and an ongoing salary differential.¹ The grants are NIS 300,000 (\$78,000 based on 2012 exchange rates – equivalent to approximately 14 months' salary) for residents choosing to work in a hospital in the periphery (irrespective of specialty) or in a specialty in crisis (irrespective of location) and NIS 500,000 (\$130,000) for residents in specialties in crisis, within hospitals in the periphery. Specialties in crisis include, among others, internal medicine, anesthesia and general surgery. In addition, the agreement pledged an additional 1000 positions to be gradually added for physicians in public hospitals, with priority given to hospitals in the periphery. Thus, unlike many programs in other countries to attract physicians to the periphery, during the study period the Israeli program focused on hospital-based physicians rather than primary care physicians (but in 2015 the incentive program was expanded to include primary care).

The incentives were paid in 2 installments. A resident who transferred to the center on his own accord within two years of beginning the residency (the minimum length of residency is 4 years) had to return the full bonus received as of that point in time. If he/she transferred to the center after more than two years in the periphery, he/she had to return an amount proportionate to the number of months left to the residency. The incentives are taxed.

Data from the Ministry of Health and Israel's largest health plan show that between the 2011 agreement and 2013, an additional 561 residency positions were approved and funded by the govern-

ment, of which 230 were in the periphery and 331 in the center of the country. Apparently, almost all these positions have been filled.

4. Study goals

- 1 To examine the impact of financial incentives and related changes on the choice of location.
- 2 To examine the overall considerations and the reasons why residents choose their location.
- 3 To identify additional ways of attracting more young physicians to the periphery.

This study was part of a broader research project that also looked at specialty choice in the wake of the new incentives [25].

5. Study method

The study was based on two main sources of information:

- **An administrative data file from the Scientific Council of the Israel Medical Association** that includes information about all new residencies in basic specialties from 2005–2014. The file includes data about residency location and specialty, with background information about the residents, such as year of birth and the places where they studied medicine and did their internship. The file includes 8138 residencies, which were started by 7027 residents (A small number of residents began a residency in one specialty and subsequently began a residency in another specialty. These residents would generate two observations in our data set). Our examination of the file focused mainly on a com-

¹ In the government hospitals, the government funds the basic pay for the residency positions, the one-time bonuses and the ongoing salary differential. In the hospitals belonging to other organizations, the organization pays for the basic pay and the ongoing differential, but the government covers the one-time bonuses.

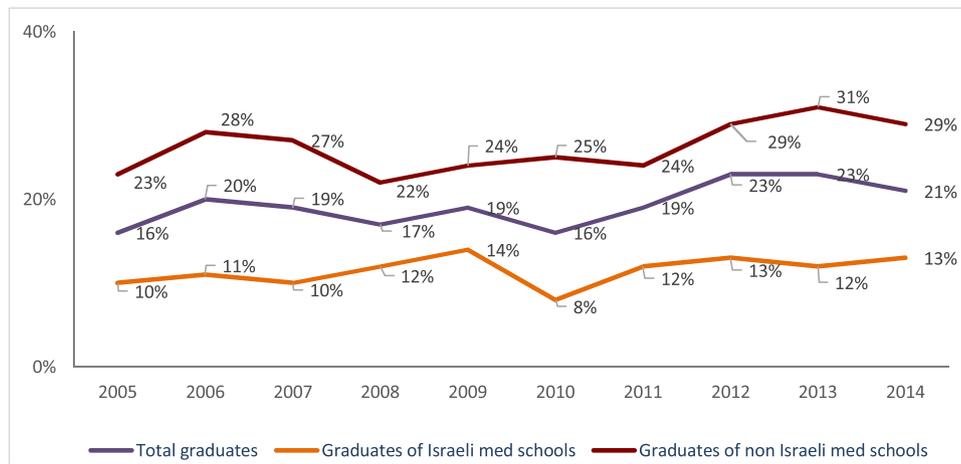


Chart 3. Share of the periphery in new residencies, by place of study (%).

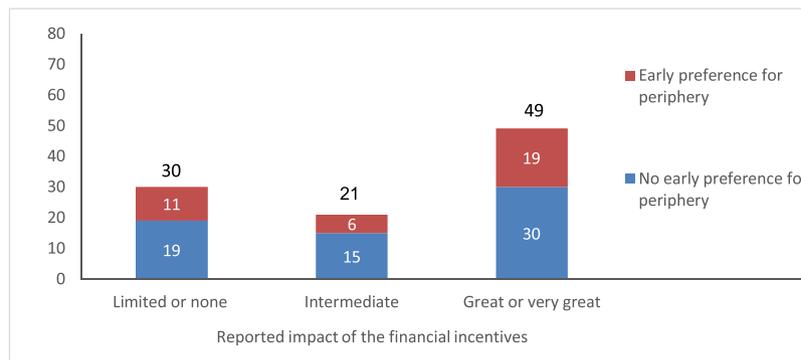


Chart 4. The relationship between early preferences and the reported impact of the financial incentives (among residents in the periphery).

parison of the years prior to the 2011 agreement with subsequent years.

- **A national survey conducted in 2015 of residents in basic specialties who began their specialization in 2013–2014.** The sample included a total of 1042 hospital residents. This included all the residents in hospitals in the periphery in which a grant was given (352 resident) and a random sample of residents in hospitals in the center of the country (690 residents). The data were weighted according to the ratio of the sample in each of the strata, and the weighted sample accurately represented the full population of residents. The data were collected via an Internet survey with telephone backup. The response rate was 71%.

6. Main findings administrative files

As indicated in Chart 1, between 2005 and 2014, the number of new residencies increased substantially (i.e. by 66%). The annual increase was gradual until 2010. In 2011, there was a surge in the number of new residencies, due to a sharp increase in the number of new residencies filled by Israeli graduates of non-Israeli medical schools (hereafter: overseas graduates). This increase is reflected in an increase in the number of new residencies in both the periphery and center of the country (Chart 2).

From 2005 to 2010, the percentage of new residencies in the periphery ranged from 16% to 20% of all new residencies (Chart 4). In 2011, the percentage of new residencies in the periphery was 19% and in 2012, the percentage rose to 23%.

Between 2009 and 2013, there was an increase of 30% in the number of overall new residencies. At the same time, there was an increase of 60% in the number of new residencies in the periphery.

Over the years, the share of the periphery in new residencies has been higher for graduates of overseas medical schools than for graduates of Israeli medical schools (who are generally preferred by hospital directors). The increase in the percentage of residencies in the periphery was due mostly to the increase in the percentage of overseas graduates in the periphery. Along with this, there was a very small increase among Israeli graduates (Chart 3).

7. Survey of residents

736 residents answered the survey, with a response rate of 71%.

7.1. Characteristics of the residents

77% of the residents were born in Israel and 57% of them are aged 30–34. 32% of the residents are Arabs and 40% are women. 55% of the residents studied medicine abroad; most in the former Soviet Union and other Eastern European countries. 47% are doing their residency in specialties in crisis and over 27% are doing their residency in the periphery.

Women constituted 42% of the residents in the center and only 37% of the residents in the periphery. This might be because of a higher proportion of Arabs and graduates of non-Israeli medical schools among the residents in the periphery, combined with the high concentration of males among Arab residents and among graduates of non-Israeli medical schools.

7.2. Preferred choice of hospital for residency

Seventy-nine percent of the respondents are doing their residency in their first choice of hospital; more residents in the center than in the periphery (82% vs. 71%, respectively) and more Israeli than overseas graduates (85% vs. 73%, respectively) are residents in hospitals that were their first choice.

7.3. Early preferences about geographic area for residency

We asked the residents in which area of the country they had thought, when they first began to study medicine, that they would like to work on completion of their studies (before the grants were offered). 40% had not had a preference at that time; 44% had wanted to work in the center and 16% in the periphery. Today, among those with a clear preference, most are working in the area where they wanted to be initially; in other words, most of the respondents currently doing a residency in the center of the country wanted to be there initially and most of those in the periphery wanted to be there initially.

7.4. Current preferences about geographic area for work after completing residency

Approximately 65% of the residents are interested in remaining in the same geographic area after completing their residency; most of the others have not yet decided.

7.5. Factors influencing the choice of hospital for residency

87% of the residents indicated that the quality of their specific department had a positive influence on the choice of residency location. Other factors noted by over 70% of the respondents were: how the hospital treats its residents, opportunities for professional development, the quality of the training given to residents, and the identity of the head of department.

Characteristics of the area had less influence on their decisions than the characteristics of the hospital itself. The area characteristics noted by over 40% of the respondents were the proximity to the locality where the respondents grew up, relatives in a nearby locality, employment opportunities for the respondents' spouses, and the future earning potential.

7.6. Impact of the incentives on the move to the periphery

We asked the residents in the periphery to what extent the incentives had influenced their decision to do their residency in a hospital in the periphery. Almost half (49%) responded that the incentives had influenced their decision to a great or very great extent, 21% responded that they had done so to an intermediate extent, and 30% reported limited or no influence for the incentives. The percentage was similar among Israeli graduates and overseas graduates, and among Arabs and Jews. A slightly larger percentage of men than women reported that the incentives had influenced their decision but the difference was not statistically significant.

The responses to a separate question revealed that a considerable percentage (approximately 40%) of the residents in the periphery who reported that the incentives had influenced their decision to a great or very great extent, thought when they started medical school that they would want to work in the periphery. In other words, about 20% of all the residents in the periphery noted that the incentives had influenced them to a great extent, but they had initially intended to work in the periphery anyway. This analysis also indicates that 30% of all the residents in the periphery noted that the incentives had influenced them to a great or very

great extent, even though they had not at first intended to work in the periphery (Chart 4).

We asked the residents in hospitals in the center if they had considered doing their residency in the periphery due to the incentives. Twenty-seven percent noted that they had considered it. 28% reported that no incentive would convince them to move to the periphery.

7.7. The connection between where the parents live and the area of residency

Interviewee responses about where their parents currently live were used as a proxy for where the interviewee grew up and we refer to it as the region that the interviewee "came from" – which the international literature suggests can be an important factor in residency location choice.

One way to look at this issue examines where physicians from each region go for their residencies. Almost all **residents from the center** of the country have remained there. Approximately 50% of those from the south have remained in the south and the remainder moved to the center; approximately 40% of those from the north have remained in the north, a few have moved to the south and the remainder have moved to the center.

A complementary perspective considers the composition of the residents currently working in each region. 77% of the **residents in the center** come from there, and 72% of the residents in the periphery came from the periphery: eighty percent of those in the north are from the north and 40% of those in the south are from the south (a similar percentage of those in the south are from the center and the rest come from the north).

Thus, both perspectives indicate that the north exports residents while the south and center import them.

In addition, an association was found between the place of residence and the place of medical studies – a higher percentage of residents who grew up in the periphery (64%) than those from the center (43%) studied medicine abroad.

7.8. Characteristics of the residents in the periphery

There are two notable differences in the background characteristics of residents in the periphery and those in the center: First, a much higher percentage of residents in the periphery than in the center (76% vs. 48%, respectively) graduated medical school abroad. Second, the percentage of Arab residents in the periphery is much higher than in the center (53% vs. 24%, respectively). There is also a difference, though much smaller, in the percentage of women in both areas: 42% in the center and 37% in the periphery.

8. Discussion

The study found that in the wake of the physicians' collective bargaining agreement of 2011 there was a large increase in the number of medical residents in Israel, in both the periphery and in the center. Regardless of the reason for the increase in the periphery (which could be due to several factors and not just the incentives), it is clear that there has been a very considerable change in the situation on the ground. There was also a small increase in the periphery's share of those residents, and that increase consisted predominantly of physicians who were graduates of non-Israeli medical schools. About half of all hospital residents in the periphery reported that the incentives contributed to their choice of residency location. However, about 40% of that group also reported that they had planned already in medical school to practice in the periphery, while 60% of that group (i.e. 30% of all the residents working in the periphery) did not have such plans prior to medical school. About 70% of the residents in peripheral hospitals grew

up in the periphery, and this is consistent with findings from other countries [7,11,12]. Thus it appears that the incentives affected residency location decisions for a non-negligible proportion of young physicians, particularly among those who grew up in the periphery.

The findings indicate a connection between where the residents' parents live and the place of residency, and residents from the periphery tend to do their residency in the periphery more than others do. This could be because they prefer to live in a familiar area and also because they might want to live near their parents, not least because in Israel grandparents are a significant source of child-care. Other forms of previous exposure to the periphery are also important. This finding fits in with findings from other countries indicating that being born or growing up in the periphery predicts both intentions and actual work there [11,26,27]. That said, there is a clear difference between the north and south, with a much higher percentage of the residents in the north than those in the south who come from the area where they are doing their residency. A partial explanation is that the number of residents who come to the north is greater than the number of residency positions, whereas the reverse is true in the south. This finding of a north-south difference among residents is consistent with a 2008–2010 survey of Israeli medical students toward the end of their studies found that about 15% preferred the North as a residency location but fewer than 5% preferred the South [28].

To achieve an increase in the number of residents in the periphery requires both an increase in the supply of residents and in the demand for residents. The 2011 agreement sought to address both these aspects of the issue. It sought to address the supply by introducing financial incentives to work in the periphery. It sought to address the demand by creating a large number of new residency positions, with the percentage increase higher in the periphery. Both of these efforts made an impact, but there remains uncertainty about the magnitude of the impact of the incentives.

We know that the number of new residencies in the periphery increased by 60% between 2009 and 2013. We also know that there was a 30% increase in the number of new residencies overall, and – all else being equal – this alone would have brought about a supply increase of 30% in the periphery. This figure increases to 36% if we take into account the composition of the new residents and the high proportion among them of physicians who studied abroad. The remaining 24% is apparently due to some mix of factors, including the incentives introduced in the 2011 agreement and the turning of young physicians to the periphery as a fallback after all available residency slots in the center had been filled; it is not possible to parcel out the exact contribution of each of these two factors.

While it is not possible to disentangle the contribution of these factors, it seems clear that the apparently unforeseen increase in the overall number of residents decreased the need for financial incentives to bring the number of residencies in the periphery to a satisfactory level. It may also have reduced the proportion of residents in the periphery who were there primarily because of the incentives and as such may have reduced the benefit/cost ratio of the incentives (by increasing the number of residents who received the incentive payments even though they would have chosen to work in the periphery anyway).

One of the interesting findings of the study is that 65% of residents in the periphery would like to continue working there after completing their residencies. It may be that the incentives contributed to this high level of interest in continuing to live in the periphery – both because they enabled more new residents to feel that they were in the periphery by choice and because it made their residency years in the periphery more comfortable economically.

The increase in the number of residents in recent years, in part due to the incentives and the creation of new positions, may make it easier to attract residents in the future. Previously, there was a vicious cycle of a shortage of residents leading to work overload,

which in turn led to fewer physicians seeking work in the periphery. The recent increase in the number of residents in the periphery has apparently led to more reasonable workloads, thereby breaking that vicious cycle.

The residents noted several factors that were important to them when they came to choose the location for their residency, particularly the quality of the department, the attitude towards residents, and the fact that would it help with their professional development and advancement. The hospitals and departments can influence these factors and they indicate possible directions for departments that wish to increase their attractiveness.

The survey also reveals that there is a high percentage of Arab physicians (32%) among the new residents. This is an important and encouraging finding since it shows that the medical profession is serving as a tool for social mobility and enhancing equality, and since Arab doctors can provide culturally suitable treatment and service to the Arab population. After completing their residencies, these physicians often help their communities both by working in hospitals that are relatively close to their communities and/or by working as community-based specialists in clinics within or near their communities. In the context of the geographical spread, this finding is important as a large proportion of the Arab physicians come from the periphery (mainly the north) and as the study findings show, physicians who come from the periphery tend to go back and work there. The trend for an increase in the percentage of Arab physicians in Israel may also have an impact on the geographical spread of physicians in Israel.

9. Limitations

This study has two main limitations: First, for reasons explained above, when analyzing the administrative data, we studied changes in the number of new residencies and not in the number of new residents. This could cause a bias, but in our estimation, any possible biases are limited in magnitude as we have looked at the trends of residents and residencies and found them to be similar.

Second, we do not have data about the number of vacant positions for residents prior or during the period of the study. We know from discussions with people in the field that in the center there were usually no vacancies (except in very specific low demand specialties), while in the periphery there were many more vacancies.

In addition, as noted in the text, the Israeli program is different from programs in many other countries in that it was aimed (at the initial stage) only at hospital residents and not at residents in primary care, and the findings cannot be generalized to that population.

10. Programmatic directions for Israeli policymakers

The study findings suggest a number of programmatic directions for Israeli policymakers, including:

- Any continued incentives should take into account the nature of the populations most like to respond to them as well as targeted at the areas of greatest need in the periphery, which have been changing over time.
- Since doctors from the periphery tend to do their residencies in the periphery more than others do, it is worth considering ways of training more physicians from the periphery in Israel, e.g., by opening specialized preparation courses located in those areas.
- Discussions with professionals in the field as well as the survey findings indicate that one way to attract residents is to create excellent departments. It is worth considering various ways of achieving this, e.g., by investing resources in attracting outstand-

ing department heads who can attract specialists and residents to the periphery.

- Another solution that is worth examining is to broaden collaboration among smaller hospitals and those in the periphery with large medical centers. This would give residents in the periphery exposure to the wider variety of cases and treatment methods implemented in the large centers.
- When examining solutions to the difficulty of recruiting residents, it is necessary to consider the difference between the north and south of the country – both regarding their characteristics and the characteristics of residents to go there – and to provide the appropriate solution to each of them.

11. Lessons for other countries

The study of the Israeli effort to attract young physicians to its peripheral regions offers several lessons for other countries facing a shortage of physicians in the periphery.

To begin with, it underscores the importance of considering both supply and demand factors; the number of physicians in the periphery will increase only if there are additional physicians interested in working there and positions which can absorb them.

The Israeli study also highlights the importance of carefully considering the personal and professional backgrounds of the physicians in the target population. These background factors can directly influence location preferences and can also modulate the influence of financial incentives.

In addition, the Israeli study highlights the importance of not treating “the periphery” monolithically. Peripheries, even within the same country, can vary substantially in the extent to which young people who grow up there become physicians and in the extent to which they are attractive to young physicians as places to live and work.

Finally, the Israeli study demonstrates how surveys and administrative data can play complementary roles in the study of financial incentives for physicians.

Depending on the country and the intervention involved, these lessons may be relevant to problem conceptualization, policy development, and/or evaluation methods.

More specifically, this study suggests that if countries are prepared to provide sizable financial incentives to encourage young physicians to work in the periphery, and in addition are prepared to expand employment opportunities in the periphery, then these changes can have an influence on a non-negligible proportion of young physicians. The influences could be greatest among those who grew up in the periphery. They are also likely to be greater if there is a coterminous increase in the supply of new physicians.

Acknowledgements

The study was funded in part by the Israel Medical Association.

Malke Borrow, Dana Fishbain, Amatzia Ginat, Baruch Levi, Amit Sharir and Ariel Yankellevich contributed significantly to the design of the study and/or the interpretation of the findings.

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