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***STAFF-RELATED ACCESS DEFICIT AND  
ANTENATAL CARE COVERAGE ACROSS THE  
NUTS 1 LEVEL REGIONS OF TURKEY***

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***Staff-related access deficit and antenatal care coverage  
across the nuts 1 level regions of Turkey***

*At the heart of each health system, the workforce is central to advancing health. The World Health Organization has identified a threshold in workforce density below which high coverage of essential interventions, including those necessary to meet the health-related Millennium Development Goals (MDGs), is very unlikely. The International Labor Organization (ILO) has launched a similar indicator –staff related access deficit- using Thailand’s health care professional density as a benchmark. The aim of this study is to assess the staff-related access deficit of the population across the 12 NUTS 1 level regions of Turkey. The main hypothesis is that staff-related access deficit has a correlation with and predicts the gap in antenatal care coverage (percentage of women unable to access to antenatal care) across different regions.*

*Staff-related access deficit, as a threshold indicator, seems to have a linear relationship with the antenatal care coverage gap. The known inequalities in the distribution of the health care workforce among different regions of Turkey were put forward once more in this study using the SRA indicator. The staff-related access deficit indicator can be easily used to monitor the status of distributional inequalities of the health care workforce at different sub-national levels in the future.*

### ***La pénurie en personnel et la couverture des soins prénataux dans les régions en Turquie***

*Au sein de chaque système de santé, le personnel est l'élément primordial pour améliorer la santé. L'Organisation Mondiale de la Santé a identifié un seuil de densité en personnel au dessous duquel il est difficile d'atteindre les Objectifs de Développement du Millénaire liés à la santé (Millenium Developmental Goals, MDGs), L'Organisation Internationale du Travail (International Labor Organisation ILO) a lancé un indicateur similaire – Déficit dans l'accès au personnel de santé - en retenant la densité des professionnels de santé en Thaïlande comme point de référence. Le but de cette étude est d'évaluer la difficulté d'accès au personnel pour la population dans les 12 régions de niveau NUTS 1 de Turquie. L'hypothèse principale est que ce déficit d'accès au personnel est en corrélation avec la couverture des soins prénataux ; c'est-à-dire le pourcentage de femmes dans l'impossibilité d'avoir accès à ce type de soins dans les différentes régions.*

*L'indicateur de seuil que représente le déficit d'accès au personnel semble être en relation linéaire avec le niveau de couverture en soin prénatal. Les inégalités de répartition en personnel de santé entre les différentes régions de Turquie ont été encore confirmées par cette étude qui utilise l'indicateur SRA. Cet indicateur de déficit d'accès au personnel peut être facilement utilisé à l'avenir pour améliorer les inégalités de répartition des personnels de santé au niveau régional.*

## **I- Introduction**

The ability of any health system to perform well in meeting the new health challenges of an ageing population, in adopting innovative technologies and in responding to both new and (re)emerging communicable diseases and ever-increasing morbidity and disability due to non-communicable diseases, while remaining financially sustainable, depends on the availability, skills, knowledge, and motivation of the health workers. Furthermore, equitable access to health workers is a critical determinant of the health system performance and therefore central to full realization of the right to health [1].

At the heart of each and every health system, the workforce is central to advancing health. There is ample evidence that worker quantity and quality are positively associated with immunization coverage, outreach of primary care, and infant, child and maternal survival. The quality of doctors and the density of their distribution have been shown to correlate with positive outcomes in cardiovascular diseases. Conversely, child malnutrition has worsened with staff cutbacks during health sector reform [2].

The World Health Organization (WHO) has identified a threshold in workforce density below which high coverage of essential interventions, including those necessary to meet the health-related Millennium Development Goals (MDGs), is very unlikely. This threshold has been estimated at 2.28 health care professionals (counting only doctors, nurses and midwives) per 1000 population, ranging from 2.02 to 2.54 allowing for uncertainty). Based on these estimates, there are currently 57 countries with critical shortages, equivalent to a global deficit of 2.4 million doctors, nurses and midwives. The proportional shortfalls are greatest in sub-Saharan Africa, although numerical deficits are very large in South-East Asia because of its population size [2].



The International Labor Organization (ILO) has launched a similar indicator using Thailand's health care professional density as a benchmark. Thailand was used as a normative benchmark because it achieves good health outcomes with a staffing ratio of one health care professional per 313 population (2004 data). However, this is a conservative minimum estimate. If, for example, health care professionals are very unevenly spread in a country, the *de facto* deficit may be much greater than the estimate based on national averages. However, if this rather "optimistic" indicator signals a national or regional problem, it might be safely assumed that the real problem is even bigger than the one indicated by national averages [3].

Almost all countries suffer from misdistribution characterized by urban concentration and rural deficits [4]. Unequal geographical distribution in Turkey has been a matter of concern for many years. Geographical imbalances seem to be related with economic development at the province level. In provinces having higher gross domestic product (GDP) per capita, the number of people per health care professional is lower. The negative correlation between per capita GDP and health care professional is stronger among physicians when compared to nurses and midwives in Turkey [5].

Eight MDGs were adopted by world leaders in 2000 and set to be achieved by 2015. These goals provide a framework for the entire international community to work together towards a common end – making sure that human development reaches everyone, everywhere. If these goals are achieved, world poverty will be cut by half, tens of millions of lives will be saved, and billions more people will have the opportunity to benefit from the global economy. "Improve maternal health" is one of these eight MDGs. There are two targets for achieving this goal. Target 5.A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio, and Target 5.B: Achieve, by 2015, universal access to reproductive health. Antenatal care coverage

(at least one visit and at least four visits) is one of the five indicators for monitoring the achievement of Target 5.B [6, 7].

The aim of this study is to assess the staff-related access deficit of the population across the 12 NUTS 1 level regions. The main hypothesis is that staff-related access deficit has a correlation with and predicts the gap in antenatal care coverage (percentage of women unable to access to antenatal care) across different regions of Turkey.

## **2- Data and methods**

The number of skilled health care workers (physicians, nurses and midwives) was derived from yearly statistics of the Ministry of Health for the years 2000 and 2006. This province level data were aggregated into NUTS 1 level. The population number of provinces from census data for 2000 and address-based population registry data for 2007 were also aggregated properly. The Turkish Statistical Institute (TurkStat) has not done a population projection for 2006, and unfortunately health workforce numbers for 2007 and thereafter were not available for the author because of bureaucratic procedure requirements; thus, 2007 population data and 2006 health workforce data were used in this study.

The ILO staff-related access deficit indicator (SRA) was calculated for each NUTS 1 level region by using the formula below:

$$SRA_x = (POP_x - PROF_x * DENS_t) / POP_x$$

where,  $POP_x$  denotes the population of region  $x$ ,  $PROF_x$  is the number of the skilled health care professionals (physician, nurses, midwives) in region  $x$  and  $DENS$  denotes the standard professional density (here Thailand's professional density, which is equal to 313 persons per one professional).

Antenatal care coverage for the NUTS 1 level regions was obtained from the Turkey Demographic and Health Surveys (TDHS) 2003 and 2008. In DHS, female respondents of reproductive age (15-49 years) were asked to provide information about pregnancies resulting in live births that occurred during the five years prior to the interview date. Assuming that mid- period SRA deficit would be related to the failure to provide antenatal coverage for a five-year period, it was decided to use 2001 and 2006 SRA deficits in the analysis. Because of availability problems, the 2000 (not 2001) SRA deficit was employed in the analysis.

### 3- Results

Table 1 and Table 2 show percentages of access deficit and antenatal care coverage gap for the 12 NUTS 1 level regions of Turkey for the 1999-2003 and 2004-2008 periods, respectively. The number of total health care professionals increased approximately 25% between the two periods (from 193,992 to 242,066). There is an obvious access deficit inequality across the NUTS 1 regions. There were nine regions with access deficit in the 1999-2003 period, while in the next period, this number decreased to four. Although the staff-related access deficit generally ameliorated in the second period, regions in the eastern part of the country still had high volume access deficits compared to the other parts.

**Table 1**  
**Some Human Resources for Health Characteristics Related to the Turkey**  
**Demographic and Health Survey-2003 across the NUTS 1 Regions.**

<b>Regions</b>	<b>Population (2000)</b>	<b>Number of health professionals (2000)</b>	<b>Access deficit (% of population) (2000)</b>	<b>Gap in antenatal care coverage*</b>
Istanbul	10 018 735	29558	9.8	8.7
Western Marmara	2895980	9561	-	8.0
Aegean	8938781	31215	-	12.2
Eastern Marmara	5741241	16148	12.0	8.1
Western Anatolia	6443236	26974	-	13.7
Mediterranean	8192324	23309	10.9	14.6

Central Anatolia	4189268	11232	16.1	19.6
Western Black Sea	4895744	13554	13.3	16.6
Eastern Black Sea	3131546	8613	13.9	13.9
Northeastern Anatolia	2507738	5472	31.7	43.0
Mideastern Anatolia	3727034	8287	30.4	43.7
Southeastern Anatolia	6608619	10069	52.3	35.0
<b>TURKEY</b>	<b>67290246</b>	<b>193992</b>	<b>9.8</b>	<b>18.6</b>

\*DHS-2003, Turkey

The gap in antenatal care coverage decreased more than 50% in the next period, from 18.6% to 7.8%, in the whole country. There was a sharp difference between the three eastern regions and the rest of the country in terms of antenatal care coverage gap for both time periods.

**Table 2**  
**Some Human Resources for Health Characteristics Related to the Turkey**  
**Demographic and Health Survey-2008 across the NUTS 1 Regions.**

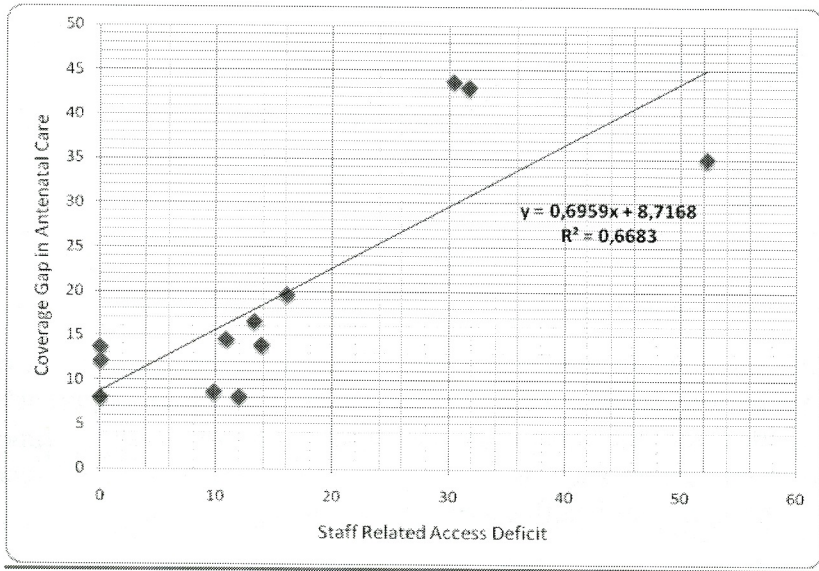
<b>Regions</b>	<b>Population (2007)</b>	<b>Number of health professionals (2006)</b>	<b>Access deficit (% of population) (2006-2007)</b>	<b>Gap in antenatal care coverage*</b>
Istanbul	12 573 836	42324	-	4.3
Western Marmara	3 052 555	10513	-	1.7
Aegean	9 299 322	38660	-	3.1
Eastern Marmara	6 417 153	21105	-	1.9
Western Anatolia	6 651 887	33955	-	6.3
Mediterranean	8 906 427	28128	1.2	5.1
Central Anatolia	3 776 927	12163	-	6.2
Western Black Sea	4 477 457	15338	-	1.3
Eastern Black Sea	2 488 652	9487	-	7.8
Northeastern Anatolia	2 212 759	5938	16.0	26.1
Mideastern Anatolia	3 558 432	10469	7.9	23.7
Southeastern Anatolia	7 170 849	13986	39.0	17.4
<b>TURKEY</b>	<b>70 586 256</b>	<b>242066</b>	<b>-</b>	<b>7.8</b>

\*DHS-2008, Turkey



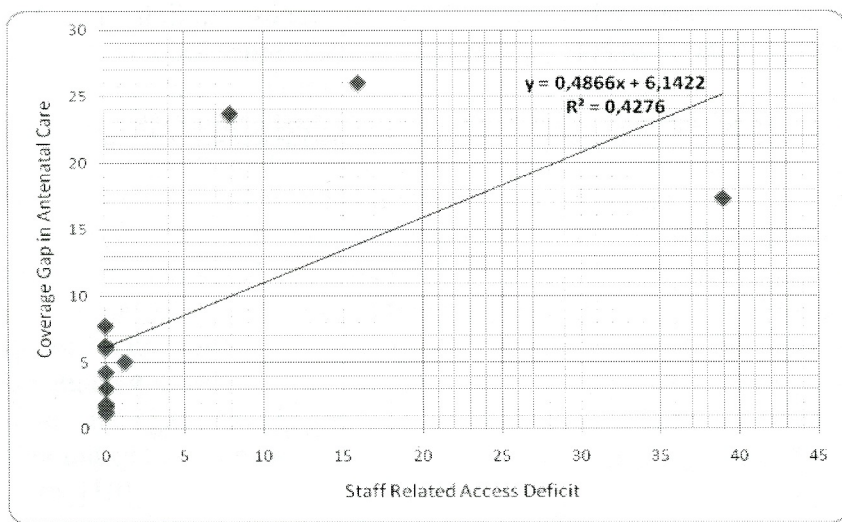
The linear relationship between access deficit and antenatal care coverage was explored by scatter plot diagrams. There was a positive linear relationship between access deficit and the antenatal care coverage gap (Figure 1 and Figure 2).

**Figure 1. Linear relationship between staff-related access deficit and antenatal care coverage gap for Turkey Demographic and Health Survey-2003.**



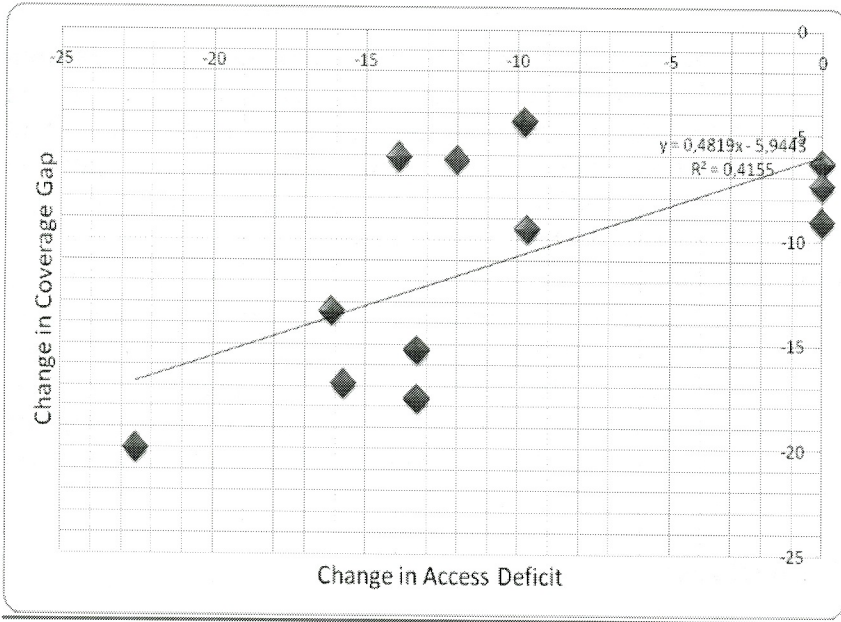


**Figure 2. Linear relationship between staff-related access deficit and antenatal care coverage gap for Turkey Demographic and Health Survey-2008.**



This relationship persisted when the changes between the two time periods were plotted (Figure 3). This panel data approach provided the advantage of the elimination of possible time invariant factors such as geographic conditions that may affect the probability of health service use in the regions [8].

**Figure 3**  
***Regression line for the changes in access deficit.***



#### **4- Discussion**

To the best of our knowledge, this is the first study in the literature in which the ILO indicator, staff-related access deficit, was used at the sub-national level. Our findings showed that half of the variance in the antenatal coverage gap could be explained by the access deficit indicator across the NUTS 1 level regions of Turkey.

It has also been shown that there were significant achievements in both antenatal care coverage and health workforce density in the last few years at the national and sub-national level. The TDHS-2008 revealed that antenatal care coverage for women increased by 50% over the period 1993-2008. While 62.3% of women received antenatal care in 1993, this rate increased significantly within recent years as a result of effective efforts. In accordance with TDHS-2008, 92% of women received antenatal

care from health care professionals at least once. Almost all of these women received antenatal care from a physician [9].

Though amelioration in the distribution and density of the health care workforce in Turkey must remain an important factor in reducing the gap in antenatal care coverage, another important factor, implementation of a new policy, should not be overlooked. Pregnant women started receiving cash aid with the implementation of the Conditional Cash Transfer (CCT) Program, launched in 2003. Accordingly, pregnant women receive 60 TL just once provided that they deliver at a healthcare center. They also collect a monthly payment of 20 TL in the antenatal period on the condition that they present at regular visits for examination; the CCT Program was effective, and the amount of cash aid totaled 3.67 million TL over the period 2005-2009 [10].

## 5- Conclusion

Staff-related access deficit, as a threshold indicator, seems to have a linear relationship with the antenatal care coverage gap. The known inequalities in the distribution of the health care workforce among different regions of Turkey were put forward once more in this study using the SRA indicator. The staff-related access deficit indicator can be easily used to monitor the status of distributional inequalities of the health care workforce at different sub-national levels in the future.

## References

1. WHO, *Health workforce policies in the WHO European Region*, in *Regional Committee for Europe Fifty-ninth session*. 2009.
2. WHO, *The world health report : 2006 : working together for health*. 2006, Geneva: World Health Organization. xxvi, 209 p.
3. ILO, *Social Health Protection. An ILO strategy towards universal access to health care. Discussion Paper 19*. 2007.
4. Gupta, N., *Exploring health workforce inequalities: case studies from three countries*. Human resources for health observer. 2010, Geneva: World Health Organization. 13 p.

5. *Human Resources in Health and Policy Dialogue Workshop*. 2007, "Refik Saydam Hifzisihha Center The School of Public Health" Republic of Turkey, MoH: Ankara.
6. UN, *United Nations Millennium Declaration*. 2000(55/2).
7. WHO. *Millennium Development Goals*. 2010; Available from: [http://www.who.int/topics/millennium\\_development\\_goals/en/](http://www.who.int/topics/millennium_development_goals/en/).
8. Stock, J.H. and M.W. Watson, *Panel Data*. 2nd ed. Introduction to Econometrics. 2007: Pearson International Edition.
9. *Turkey Demographic and Health Survey-2008*. 2009, Hacettepe University Population Studies Institute.
10. *Millennium Development Goals Report Turkey 2010*, T.R. Prime Ministry Undersecretariat of State Planning Organization.