

An overview on Urban-HEART Tehran experience

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Why inequalities in health?

Talking about 'health inequality' in public health implicitly denotes 'socioeconomic inequality in health'.^[7] The distinction between 'inequity' and 'inequality' in health is rather a philosophic dilemma (theories of 'justice' and 'society').^[8] To acknowledge the importance of striving for equity, in particular health equity, it is necessary to know the extent of the differentials in health and its determinants found in the world today. In every part of the world, and in every type of political and social system, differences in health have been noted between different social groups in the population and between different geographical areas in the same country.^[9]

There is consistent evidence that disadvantaged groups have poorer survival chances, dying at a younger age than more favoured groups. For example, a child born to professional parents in the United Kingdom, can expect to live over 5 years longer than a child born into an unskilled manual worker's household.^[10] According to the final report by the Commission on Social Determinants of Health (CSDH), in Japan or in Sweden, people can expect to live more than 80 years; in Brazil, 72 years; in India, 63 years; and in one of several African countries, fewer than 50 years. And within countries, the differences in life chances are dramatic and are seen worldwide.^[11] In France, the life expectancy of a 35-year-old university lecturer is 9 years more than that of an unskilled manual worker of the same age.^[12] In Hungary, the Budapest Mortality Study found that males living in the most depressed neighbourhoods had a life expectancy of about 4 years less than the national average, and 5 years less than those living in the most fashionable residential district.^[13] In Spain, twice as many babies die among families of rural workers as among those of professionals.^[12] In Iran, infant mortality rate in poor provinces was 2.34 times more than that in affluent areas in 2005.^[14]

The way in which health inequality has customarily been documented is by comparing differences in the average health across groups, for example, by sex or gender, income, education, occupation, or geographic region. In the controversial World Health Report 2000, ^[15, 16] researchers at the World Health Organization

criticized this traditional practice and proposed to measure health inequality across individuals irrespective of individuals' group affiliation. [17]

What is Urban HEART?

Employing a recently developed tool to assess the gaps in health status of the urban population and its determinants, named **Urban Health Equity Assessment and Response Tool (Urban HEART)** developed by the WHO Centre for Health Development located in Kobe, Japan (WKC), may provide a contemporary example for inequality reduction efforts in urban areas.[19] Urban HEART helps countries and districts to systemically generate evidence to assess and respond to unfair health conditions and inequity in urban settings. It will also stimulate city-to-city learning and sharing experiences among the countries and across regions.

An improved model in Tehran incorporates six domains of infrastructure, social and humanity development, economics, governance, health and nutrition. Most of these indicators are being monitored for the first time, specifically in an urban area, as part of a large population-based survey which also includes measures of mental health, social capital, quality of life, smoking, violence, disabilities, Fair Financial Contribution Index, calorie deprivation, transparency, citizen satisfaction, and social contribution.

Goals of Urban HEART

The Urban Health Equity Assessment and Response Tool seeks to guide policy and decision makers at national and local levels, to:

1. Identify the differences between the health, health determinants and well being of people living in disadvantaged urban areas and the general population; and
2. Determine appropriate, feasible, acceptable, and cost-effective strategies, interventions and actions which should be used to reduce inequity gaps between people living in the same city.

Box 1: Expected achievements of Urban HEART

- Improved health and social status of people living in urban poor/ disadvantaged areas
- Communities mobilized to promote health and its equity determinants
- Acknowledgement of the importance of the social determinants of health (SDH) in health equity
- Promotion of inter-sectoral action to reduce inequity in health and development at the city level
- Valid and comparable equity data and analysis
- Priority interventions/actions/response planned and implemented

Employing Urban HEART may have several bi-products for different parties such as determining a unique index to measure inequities for policy makers, identifying current gaps and relationship to other indices for public health practitioners, and empowering interested parties whether community-based organisations, state or councils at localities, or ordinary inhabitants.

How does Urban HEART assess inequality?

Urban HEART is rather a strategic approach to define and track equity and health equity in urban settings. The Urban HEART has a health equity “assessment” component to measure equity, and a “response” component that encourages urban local governments to employ the best approaches to fill the existing health equity gaps.

The former component assists the authorities in cities to conduct a systematic assessment of unfair health conditions in the urban setting. To do this, it stimulates users to think about the equity aspect of various health-related indicators.

For ease of analysis, the tool suggests reviewing evidence within four major policy domains:

1. Physical environment and infrastructure
2. Social and human development
3. Economics
4. Governance

These policy domains were extended to six in the Tehran model (Box 2).

The health equity assessment component also has a MONITOR and a MATRIX, tools that enable policy and decision makers to plot health indicators (e.g. percentage of households with access to safe water) in such a way that a quick comparison can be made between the city and country (and ultimately global or international standards) and the extent of difference between disadvantaged city areas, the rest of the city and the country average. This process highlights and emphasizes the value of using evidence in decision making.

Establishment of Urban HEART team

In October 2007, the WHO Country Office of the Islamic Republic of Iran offered the opportunity to pilot test Urban HEART in Tehran Municipality. Working groups were subsequently organized corresponding to all four policy domains so as to compromise on the best indicators appropriate for an equity assessment in Tehran alongside four other pilot cities in the world. As a result, 65 indicators in 6 domains were developed: physical environment and infrastructure, human and social development, economics, governance, health, and nutrition (Box 2).

Box 2: Urban HEART policy domains adapted in Tehran

1. Physical environment and infrastructure
2. Human and social development
3. Economics
4. Governance
5. Health
6. Nutrition

Urban HEART workshop in Tehran

In April 2008, Tehran welcomed delegates from other Urban HEART pilot sites, WHO Centre for Health Development, located in Kobe, Japan, and WHO Office for Eastern Mediterranean Region (EMRO) to discuss and agree on the assessment framework and to finalise the indicators. Delegates from India, Philippines, Zambia

and Brazil attended the meeting. All pilot sites presented their works regarding the indicators used in their own countries to investigate inequalities in health.

Tehran team also presented its indicators, which was appreciated by the participants. The indicators are summarised in Table 1.

The main outcomes of the Tehran workshop were: (a) orientation of all pilot countries with concept and methodology for implementation of Urban HEART; (b) agreement on a set of indicators proposed by the pilot countries; and (c) a draft Plan of Action for introduction of Urban HEART in each pilot site. At the meantime, Tehran model with six policy domains and extended number of indicators was conceded.

Table 1 Indicator set developed for Tehran pilot assessment

<p>1. Physical environment and infra-structure</p> <ul style="list-style-type: none"> 1.1. Safe drinking water: microbial, nitrate and nitrite 1.2. Traffic accidents 1.3. Burning 1.4. Fall 1.5. Other domestic accidents: Electric shock, suffocation 1.6. Air pollution 1.7. Noise pollution 1.8. Access to public transport 1.9. Solid waste management 1.10. Health centre utilisation
<p>2. Governance (within Municipality)</p> <ul style="list-style-type: none"> 2.1. Annual reports by Municipality (within districts) 2.2. Satisfaction of citizens with Municipality services 2.3. Lawfulness 2.4. Responsiveness to citizens complaints (Hot Lines) 2.5. Contracts transparency (quantity, monetary) 2.6. Community participation (local elections, financial) 2.7. Standard activities
<p>3. Economics</p> <ul style="list-style-type: none"> 3.1. Employment 3.2. Residency in normal home 3.3. Person per room 3.4. Fair Financial Contribution Index (FFCI) 3.5. Catastrophic costs 3.6. Household costs 3.7. Absolute poverty 3.8. Relative poverty 3.9. Social Welfare Index 3.10. Human Development Index (HDI)

4. Social and human development

- 4.1. Education: Net Enrollment Rate
- 4.2. Education: Gross Enrollment Rate
- 4.3. Attaining final year of primary school
- 4.4. Primary school completion
- 4.5. 15-24 years illiteracy
- 4.6. Adult illiteracy
- 4.7. Higher education
- 4.8. Domestic violence
- 4.9. Street violence
- 4.10. Death due to suicide
- 4.11. Death due to intentional accidents (homicide)
- 4.12. Disabilities due to violence
- 4.13. Adult smoking
- 4.14. 13-15 year-old smoking
- 4.15. Addiction
- 4.16. Smoke-free places
- 4.17. Mental health
- 4.18. Social capital

5. Nutrition

- 5.1. Calorie poverty
- 5.2. Wasting
- 5.3. Stunting
- 5.4. Low Birth Weight
- 5.5. Food diary (within the last 24h)
- 5.6. Food costs
- 5.7. Cereal costs
- 5.8. BMI: obesity and underweight

Development of data collection tool

Available sources of information at international, national and local levels were reviewed to determine the appropriate approaches for data collection for all 65 indicators. A Technical Advisory Committee (TAC) was set up to determine which data collection approach is appropriate for the next steps. TAC considered all available tools in the six policy domains. According to the documents reviewed in the

working groups and TAC, several indicators were selected to be investigated through a new survey questionnaire. Then various questionnaires to assess the relevant indicators, either developed by experts or previously validated, were suggested by working groups.

Among the very diverse set of data collection tools reviewed, some were found to be un-validated, inappropriate, unfeasible or redundant. A comprehensive questionnaire, therefore, was developed by TAC so as to collect data for 42 indicators. The TAC's approach to reach consensus among different parties including working groups and relevant organisations was quite prolonged and complicated. To do this, each indicator was discussed in separate meetings, inviting relevant experts from different units. Ultimately, the Urban HEART questionnaire was developed which consisted of 12 sections (Box 3).

Box 3: Components of Urban HEART Questionnaire - Tehran Model

1. House identification
2. General particulars of all family members
3. Home facilities and assets
4. Health, vaccinations and death status within the family
5. Accidents and injuries
6. Domestic violence
7. Disabilities
8. Responsiveness, satisfaction (with municipality activities)
9. Household costs
10. Smoking and addiction status
11. Mental health status (GHQ)
12. Health-Related Quality of Life (SF-12)

A specific questionnaire to assess 'social capital' was added to the main questionnaire, after the pilot study. The social capital questionnaire had been employed in a couple of surveys at national and local levels prior to the Urban HEART survey.

Method

Pilot study

In late June 2008, fifty families from each of 5 selected districts of Tehran, a total of 250 households, were stratified and randomly selected using GIS data of Tehran to test the questionnaire. The questionnaire was understandable to respondents and took around 25 minutes on average to complete. Results indicated understandability of the tool on one hand and, on the other hand, disparities in different indices. Amendments were considered for the questionnaire based on expert group comments and feedback from test respondents.

Using GIS maps and a software to select random numbers, blocks were randomly identified to be included in the survey. We required eight households in each block according to an eight-box table, which stands for four age groups (15-24, 25-44, 45-64, and over 65 years) for both sexes. Employing a standard sample-finding method in population surveys, investigators started sample-finding in each block by counting all houses first (by counting rings and excluding business places, and vacant houses/flats), and then dividing the total house numbers by eight to reach the 'gap number'. Following this, the investigator had to start the sample-finding from the far right hand side using a random number, and then skipping the 'gap number' so as to find the second house. No substitution was permitted to ensure the randomisation.

Sampling

In order to provide a representative sample, the Urban HEART survey was performed through a 4-stage sampling scheme. First, stratified sampling was established, considering each district as a stratum. Secondly, cluster sampling was conducted in each strata in which 120 blocks, equivalent to clusters, were chosen using GIS data, then approved by three methodologists (who were completely aware of socioeconomic and geographical situation in Tehran) to ensure equal geographical distribution and also inclusive coverage of neighbourhoods with a variety of socio-economic status. Thirdly, within selected blocks, a systematic random sampling of households was performed so that the self-administered

questionnaires (GHQ, SF-12, and Social Capital tool) could be completed by a representative sample of the general population in four age groups (15-24, 25-44, 45-64, and over 65 year old) in both sexes. The surveyor, under the supervision of an experienced researcher, had to count all residential places (excluding vacant/abandoned houses, non-residential, and pensions). Therefore, eight households were approached in each block, which strikes the total number of households to at least 960 in each district and more than 21 120 households in Tehran. Finally, in order to avoid intra-class correlation within households, individuals were selected from each family unit based on a predetermined age-gender table for participation in this survey. Overall, 22 300 questionnaires were distributed in Tehran.

Method of administration

Urban HEART in Tehran measured inequalities in 6 policy domains, which are physical environment and infrastructure, social and human development, economics, governance, health and nutrition, with 65 indicators altogether (Asadi-Lari et al, 2010).

Ten sections of the questionnaire were asked in an interview which took around 25 minutes, and three sections (SF-12, GHQ, and social capital tool) were self-administered by selected individuals within the household. In case the respondent was illiterate or not in a good condition to self-administer the questionnaires, the questionnaires were completed through an interview.

Supervision and monitoring

There were two main monitoring systems to guarantee proper implementation of the survey. Every two surveyors had a mentor to ensure proper field work, and each district had a high-ranked supervisor from academia to observe all relevant activities within the district and to check the quality of sampling, data collection, communication with families, and compliance with standards. Mentors were experienced in various national field surveys including the last census which took place in 2006.

Field investigators were asked to refer any problem during the survey to their mentors and supervisors.

Results

Physical environment and infra-structure domain

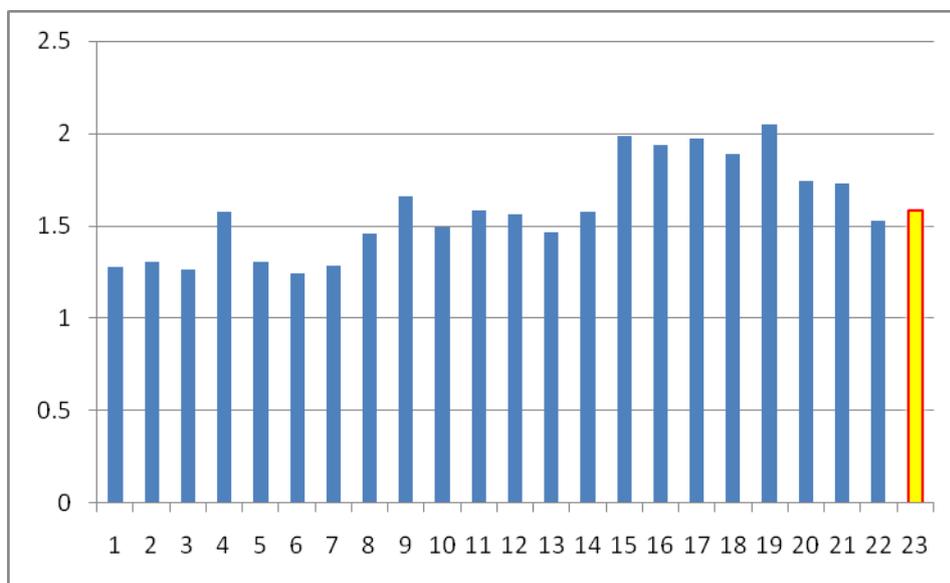
Person per room

This figure was obtained by dividing family size by number of rooms available to the family. Rooms were counted provided that:

- Minimum size was met, i.e. at least an area of 4 square meters with 2 meters in height.
- Kitchen, bath and store space were excluded.

The average numbers of person-per-room are shown by district in Figure 1. The last column (in yellow) shows the average for Tehran.

Figure 1: Average number of persons per room by district

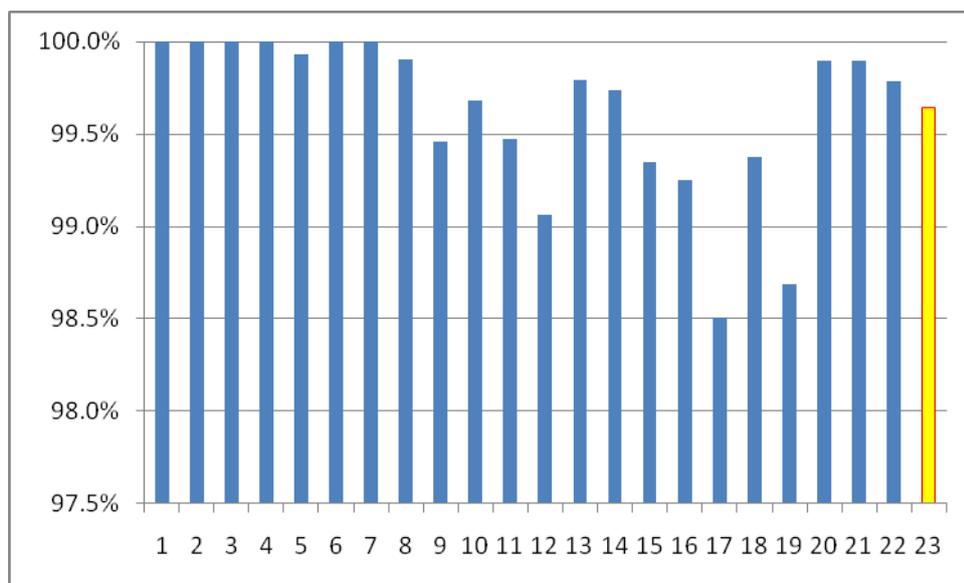


The person-per-room figure is evenly distributed in Tehran, where affluent districts (1, 2, 3, 5 and 6) accommodate less people than disadvantaged areas (districts 15 to 19).

Piped water

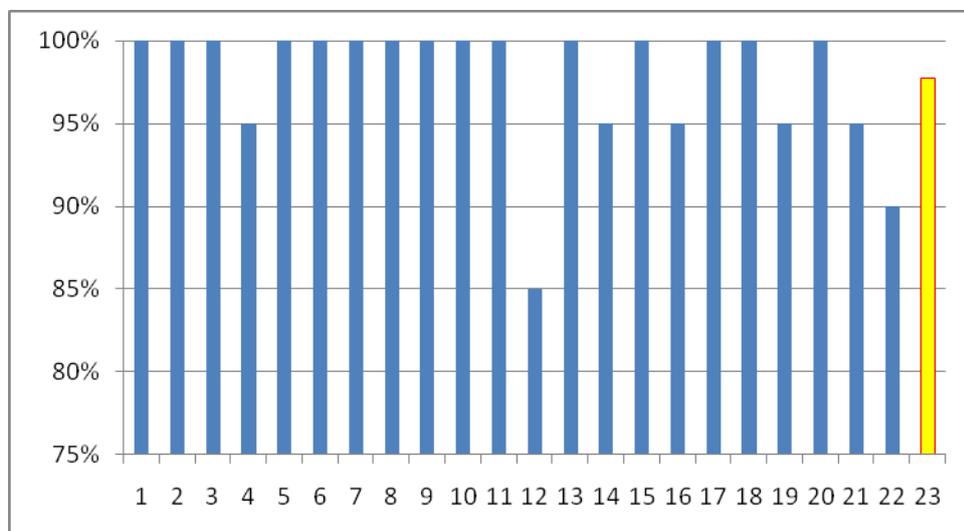
Households were asked whether they had an independent access to piped water within their house, or a shared access.

Figure 2: Independent access to piped water by district



Most districts had 100% independent access to tap water, and the maximum coverage gap was just 1.5%, i.e. less than 15 households in district 17 had a shared access to tap water. Lack of access to tap water, however, could be seen more in deprived districts of Tehran. While there was some variation in the quality of tap water across districts, results revealed from a supplementary survey within all 22 districts indicated that, at the time of sampling (summer 2009), most districts had an acceptable level of safe tap water (Figure 3).

Figure 3: Percentage of desirable results from microbiological tests of tap water by district



Smoking

Households were questioned whether any family member smoke cigarette or pipe-water. Current smoking was based on WHO definition.

Smoking rate by gender

On average, current smoking, either cigarette or pipe water, amongst families in Tehran was similar to the national level. The prevalence of male current smokers in households in advantaged districts was lower than that in other districts (Figure 4). The distribution of female smokers, however, was up to 5 times more in affluent areas compared to the lower rates in disadvantaged districts (Figure 5).

Figure 4: Male current smoking rate by district

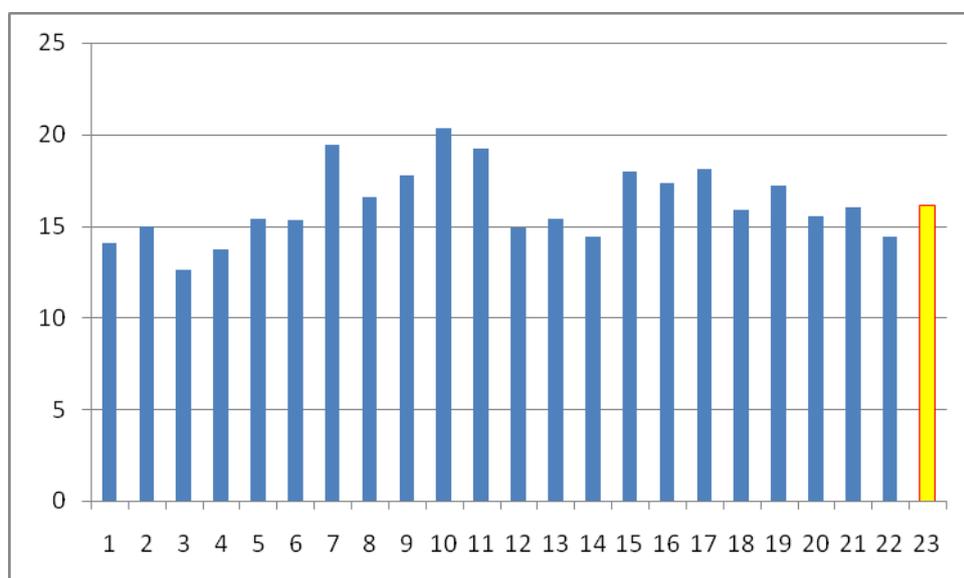
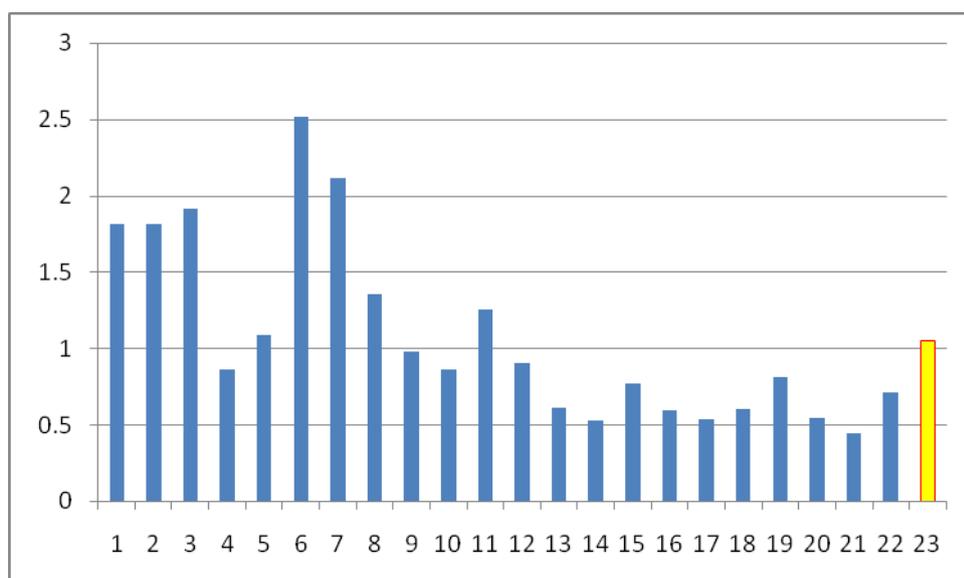


Figure 5: Female current smoking rate by district



Adolescent smoking

An uneven distribution of adolescent (13-18 years old) current smokers existed among Tehran districts; several districts had lower rates than the national figures (Figure 6). This may have been due to the methodological differences between the two surveys. In Urban HEART, families were asked whether there was any

adolescent smoker; family members may not be aware of adolescent smoking or they may intentionally hide this fact. While in national youth tobacco surveys, the students are asked to report anonymously if they had ever smoked, which may increase reporting of smoking behavior.

Figure 6: Adolescent male current smoking rate by district

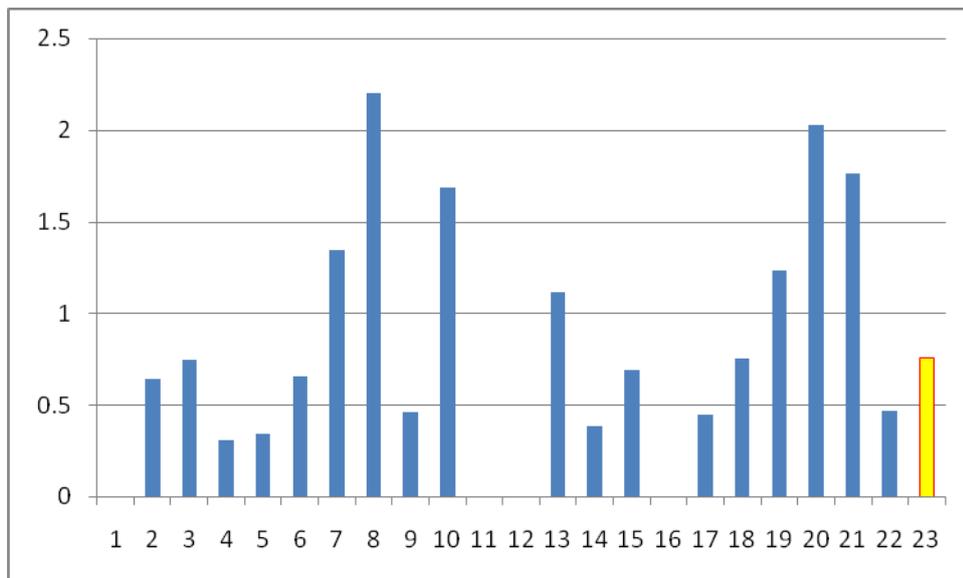
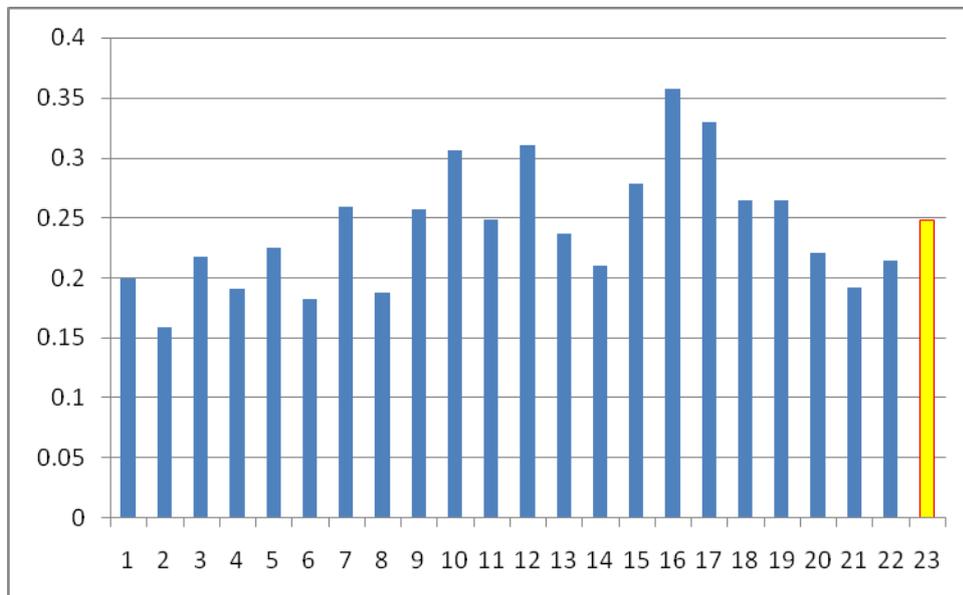


Figure 7: Passive smoking rate among children under five, by district



A total of 4 394 children under the age of five (5.4% of total population surveyed) were identified in this study; among them 1 089 (24.8%) children lived with a family member who is a current smoker (Figure 7). Prevalence of exposure to second-hand

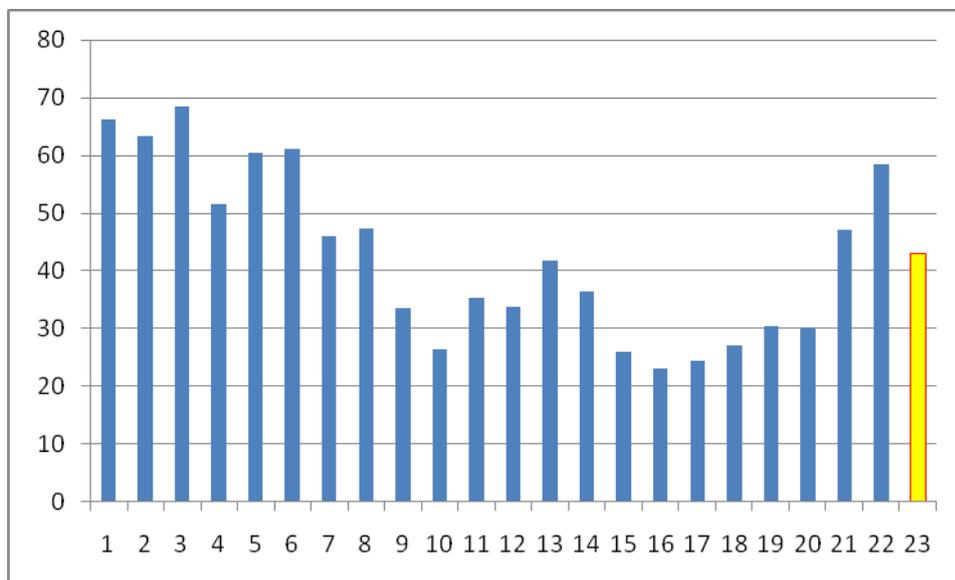
smoke in the household among under-5 children varied significantly among the 22 districts ($p < 0.001$), ranging from 15.8% (district 2) to 35.8% (district 16), with generally higher rates of exposure in more disadvantaged areas.

Transport

Car ownership

Families were asked whether they possess at least one car (regardless of the type of car) and if they use their own car for business. Ownership of cars in the affluent districts was up to three times more than that in the disadvantaged areas (Figure 8).

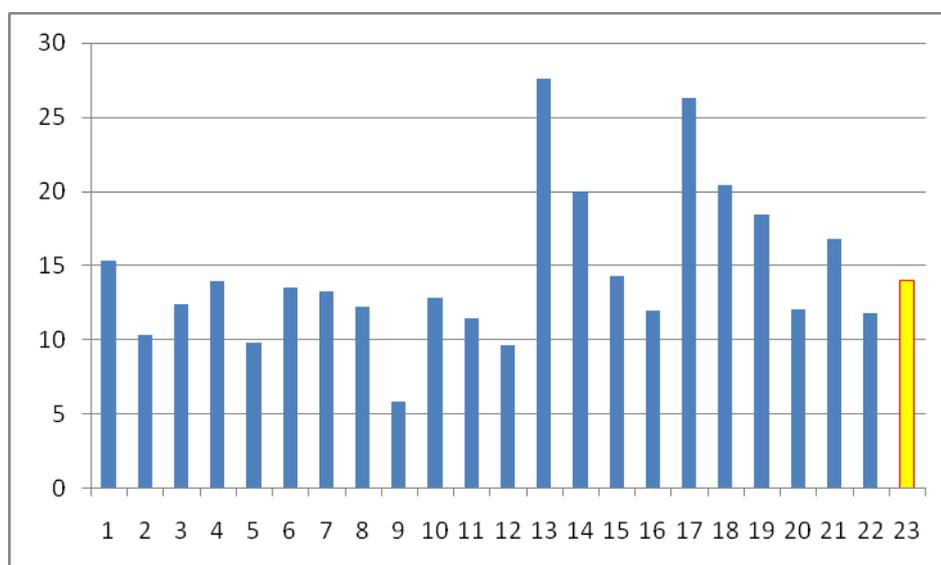
Figure 8: Car ownership by district



Public transport

In a field survey conducted separately from the household survey, district inhabitants were asked about the time it takes for them to board a public vehicle, including the time it takes to reach the nearest bus stop or underground station and get on board a bus or train. The following figure shows that residents in some districts (districts 13, 14, 17 & 18) have to spend substantially more time to access the public bus than people in other districts (Figure 9).

Figure 9: Time from home to public transport (bus) in minutes, by district



This disparity in access to public transport might be due to crowded traffic in some areas, insufficient access to public transport routes, and a shortage of buses. The situation is exacerbated by the fact that there is a relative lack of car ownership in the more deprived areas of the city, and thus, there is a heavier demand on public transport in those same areas where access to public transport is worse.

Household assets

Several household assets and belongings were examined, including personal computer (Figure 10), freezer (Figure 11), bath, toilet, kitchen, car, motorcycle, landline telephone, and mobile phone. Main energy source was also questioned.

Figure 10: Ownership of personal computer by district

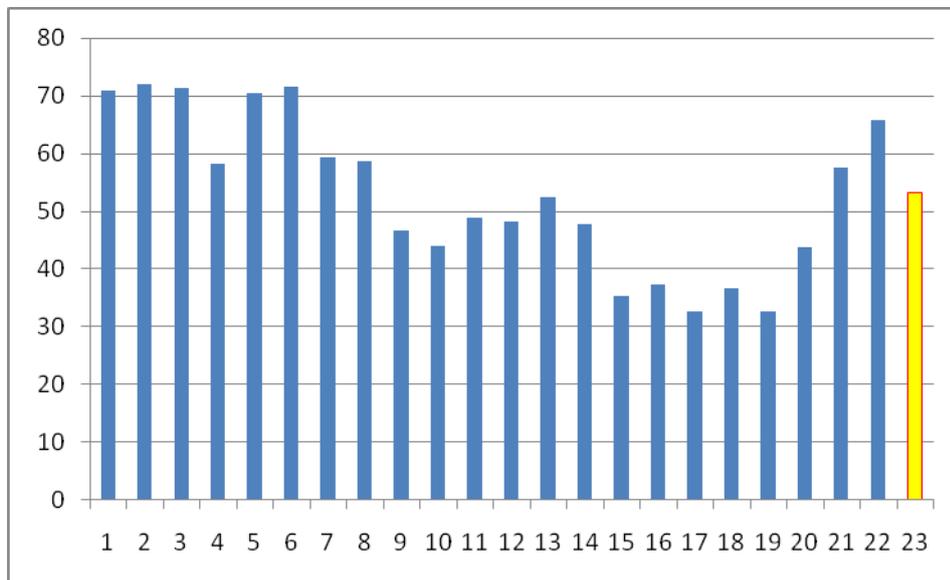
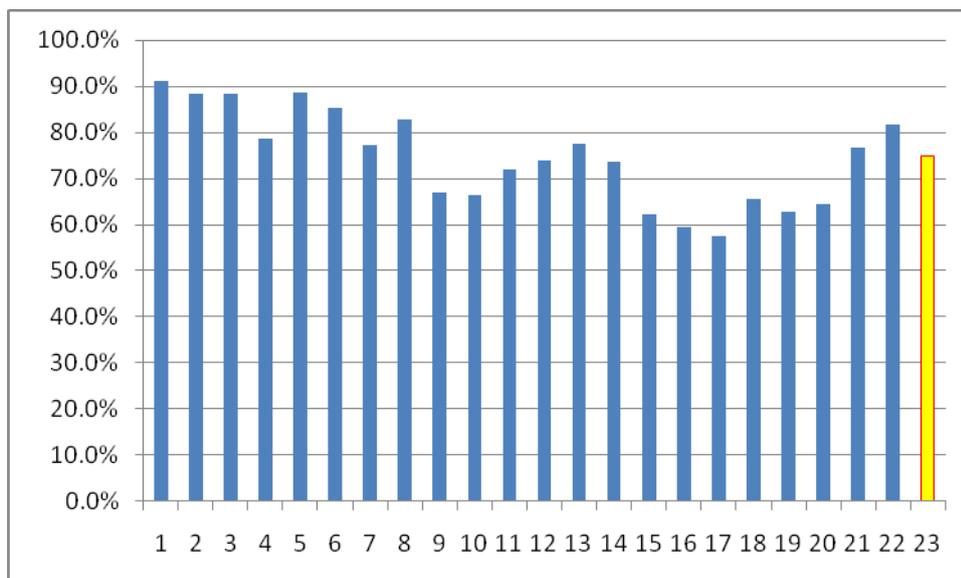


Figure 11: Ownership of freezer by district

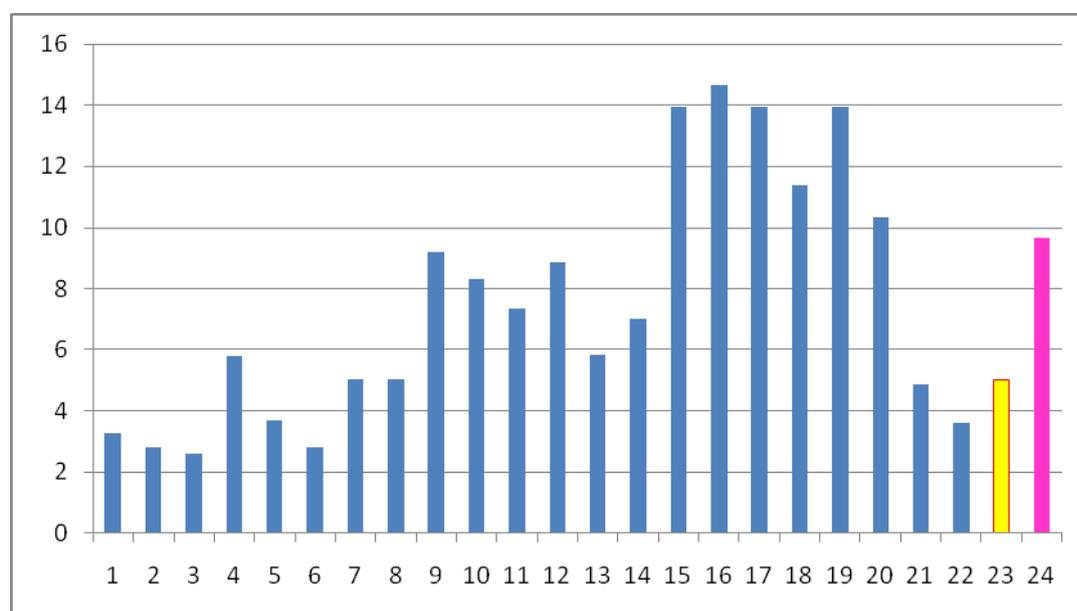


Social and Human Development Domain

Illiteracy rate

Education level was asked from all household members over 6 years of age, and pre-school attendance was asked from children over 5. The average illiteracy rates among people over age 15, calculated by district, are shown in Figure 12. The corresponding rate for men is shown in yellow and that for women in pink.

Figure 12: Illiteracy rate among people over 15 years of age, by district



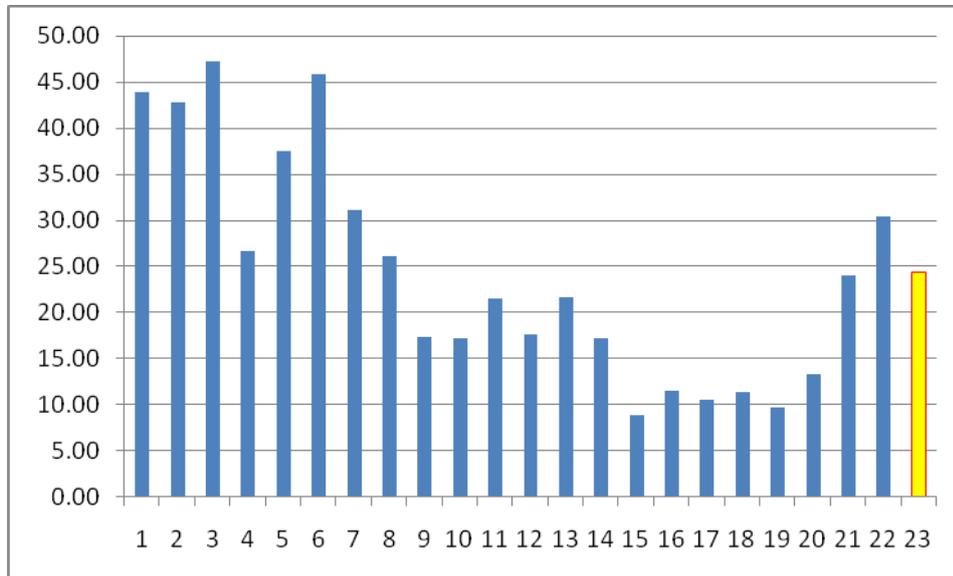
Although the average 15+ illiteracy rate in Tehran is about one-third of the national figure, and the highest illiteracy rate among Tehran districts (nearly 15% in District 16) is still less than the national figure, the rates vary significantly across the 22 districts of Tehran. Disadvantaged districts have up to 7 times more illiterate people over the age of 15 than the affluent districts, which may be due to higher migration rates in some zones like districts 15-19. Also, on average, women have almost twice as high an illiteracy rate than men.

Higher education

Nearly one fifth (18.5%) of all households stated at least one of their members had a university degree (or is studying at the university); of these, 5.7% were technical degrees (attending 2 years of university), 10.4% Bachelors, and 2.4% with Masters

or higher degrees. Level of higher education was significantly higher in the affluent districts than in the less affluent districts (Figure 13).

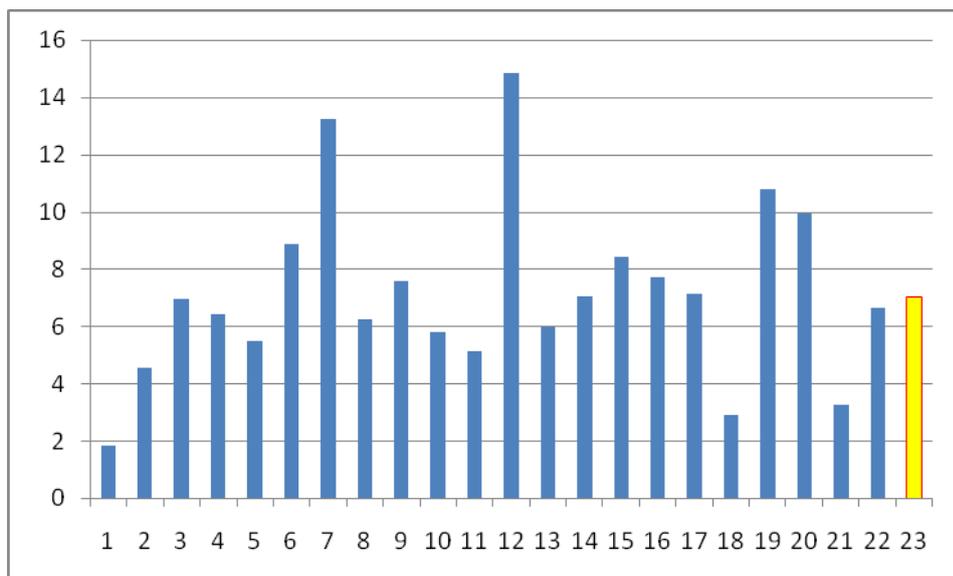
Figure 13: Higher education attainment in Districts of Tehran



Violence rate

Households were asked about domestic violence in three categories: verbal, physical without complications, and physical violence with complications. Of all 22 135 families, 6.7% had a positive response to this question. Severe violence was assigned to physical violence either with or without complications.

Figure 14: Severe violence rate (per 1 000) by district



Social capital

The abridged specific social capital tool was validated in the Iranian population for the first time. The social capital questionnaire consists of 9 questions, which measure the concepts of “voluntary help” (Figure 15), “trust” (Figure 16), “collective activities”, “social cohesion”, and “value” in different layers from close family members to the general Iranian population. “Respect to values” was measured through faithfulness, trust, honesty and reliability, fairness, truth and straight. All answers were based on a Likert scale ranging from never (1) to completely (5).

Figure 15: Social capital scores by district: Voluntary help component

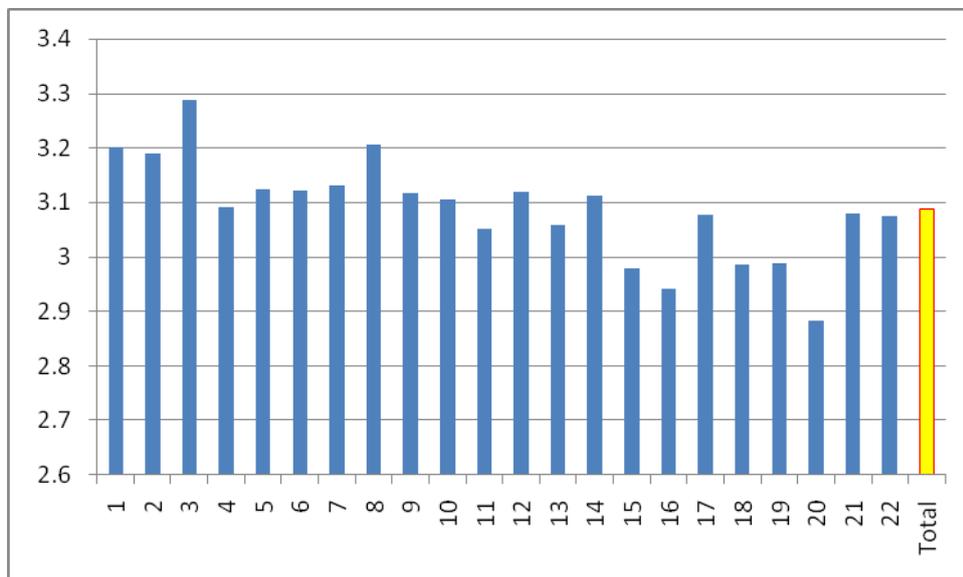
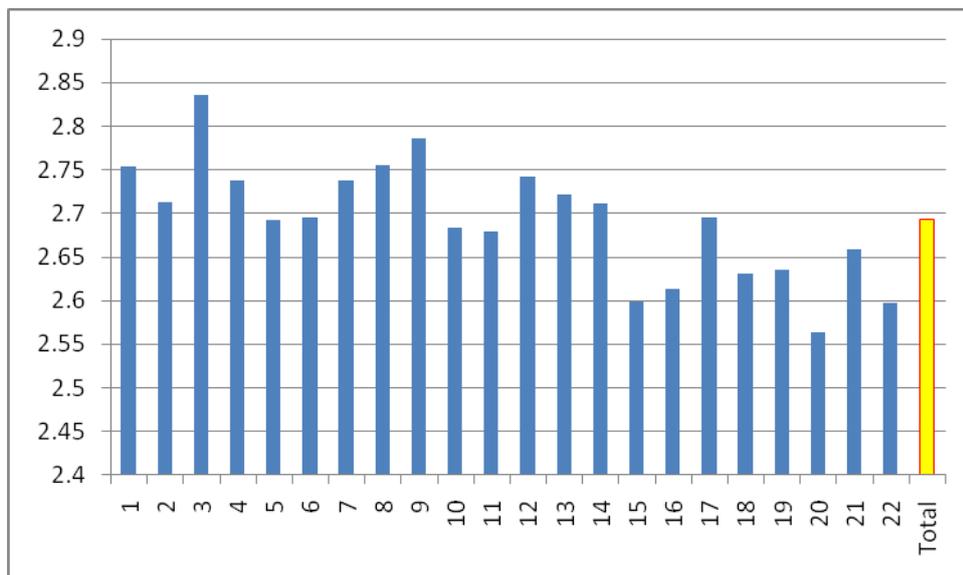


Figure 16: Social capital scores by district: Trust component



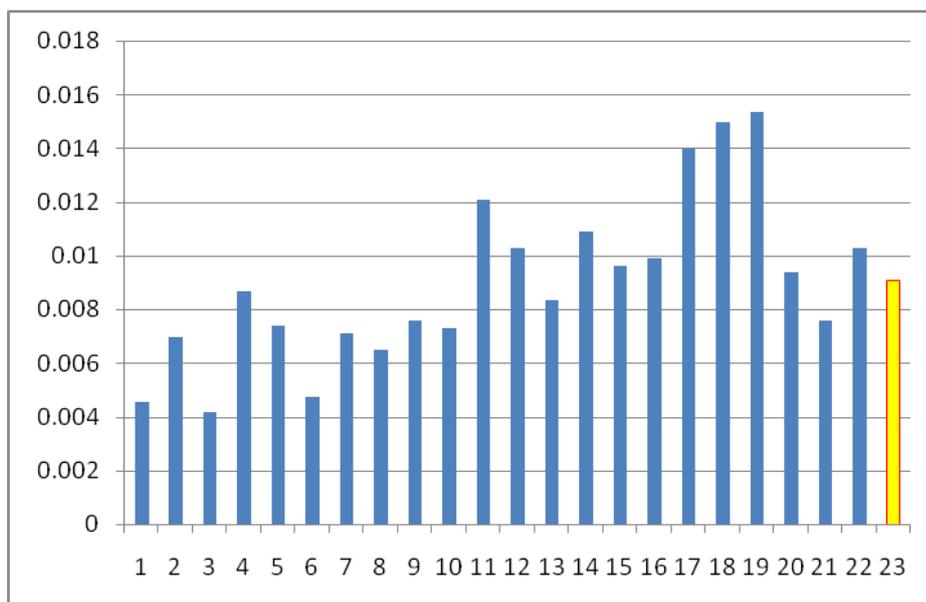
Health domain

Demographic patterns

Birth rate

Families were asked whether there was any child born during the previous year. The birth rate in some disadvantaged districts (districts 17-19) was nearly four-fold that in more affluent areas.

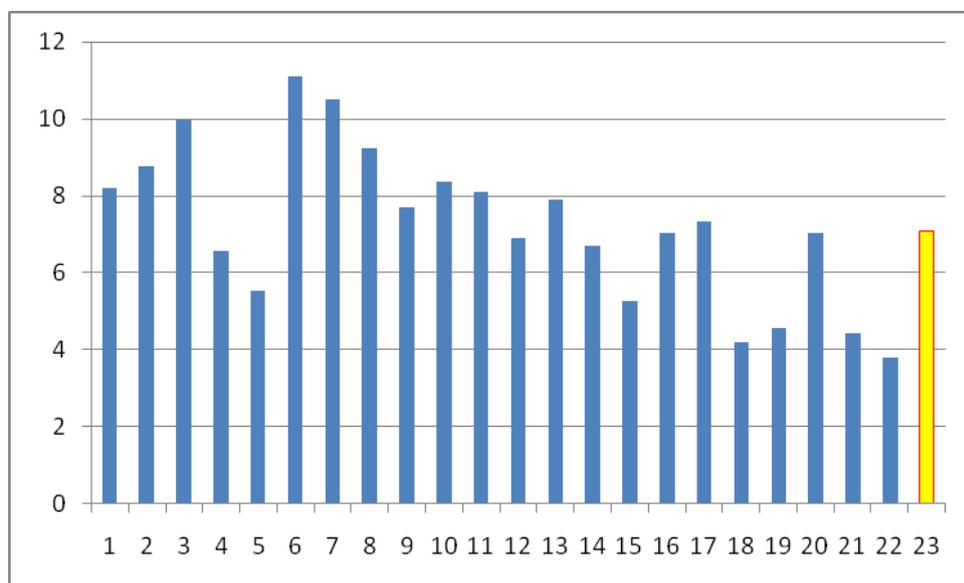
Figure 17: Birth rate in previous year by district



Elderly population

The elderly population (over 65 years old) was mainly concentrated in the more affluent districts, with the highest rate in district 6 (11.1%)(Figure 18). Districts 18-19 (marginal zones in the south-west part of the city) and 21-22 (the newest districts) have the smallest proportions of the elderly population.

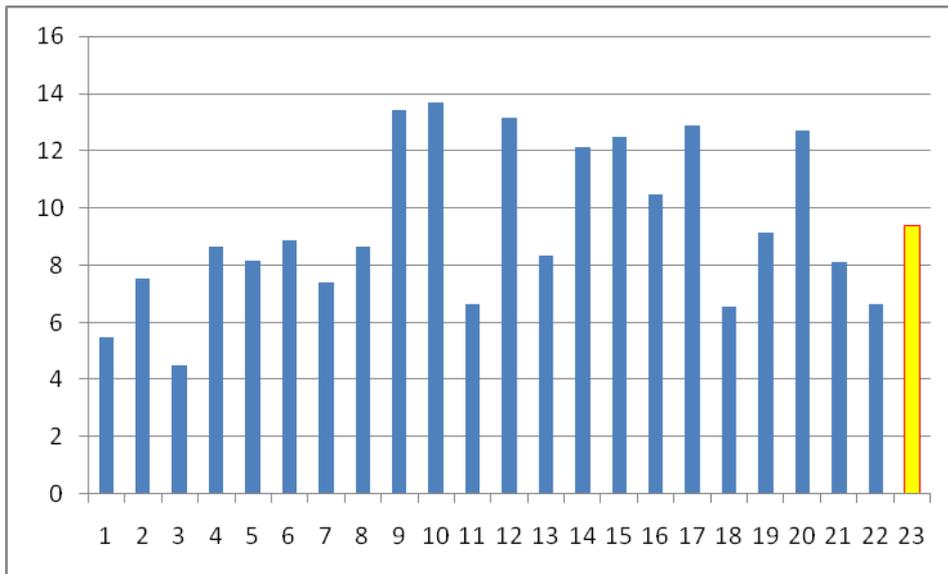
Figure 18: Over 65 population by district



Disability

Disability was questioned in five major areas, which were blindness, deafness, paralysis, limb amputation, and mental retardation. Any family member who had at least one of these major disabilities was counted as having a 'severe disability'. The chart below indicates that this indicator had an uneven distribution among Tehran districts (Figure 19). Generally, however, fewer disabled people are living in the more affluent districts.

Figure 19: Households with a severely disabled person (per 1000) by district



Mental health

Through this large cluster random sampling, 19 370 urban dwellers (87% response rate) of all 22 districts in Tehran in four age groups (15 years and above) were selected and evaluated using a validated version of GHQ-28. The best cutoff point, determined using the conventional scoring method, was six. Sensitivity, specificity, and overall misclassification rate for this cut-off score were 84.7%, 93.8% and 8.2%, respectively.

As a result, one third of this population was suspected to have mental disorders (37.9% of women and 28.6% of men) (Figure 20). Women had a relative risk of mental disorders of 1.3 compared with men. The risk of mental disorders increased with age. Divorced or widowed people were 1.5 times more at risk. The highest risk of mental disorders was seen among housewives and unemployed men. Anxiety (Figure 21), aggressiveness, insomnia, not feeling well, weakness and disappointment were the most frequent symptoms. Anxiety and somatisation (Figure 22) symptoms were more common than social dysfunction and depression (Figure 23).

Figure 20: Prevalence of suspected mental disorder, by district

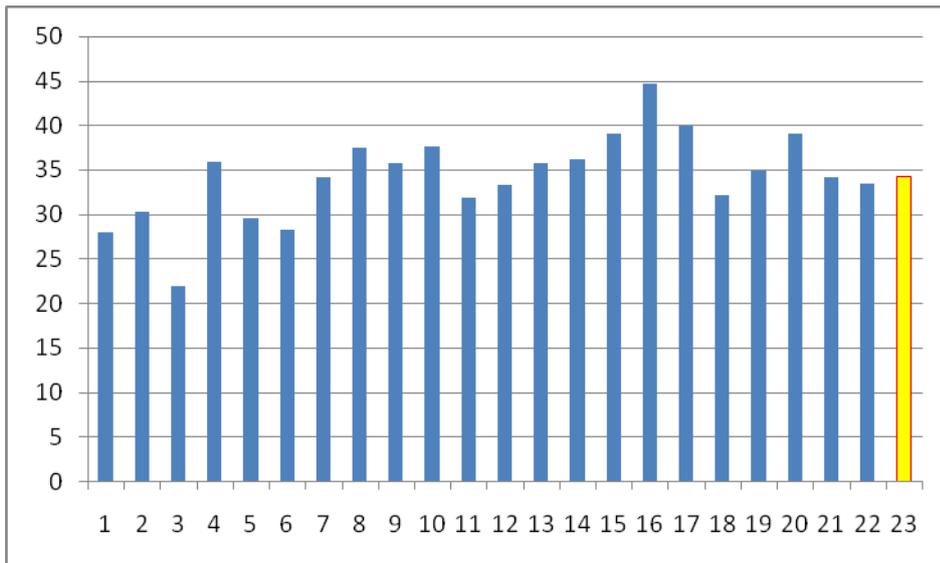


Figure 21: Prevalence of anxiety disorder (%) by district

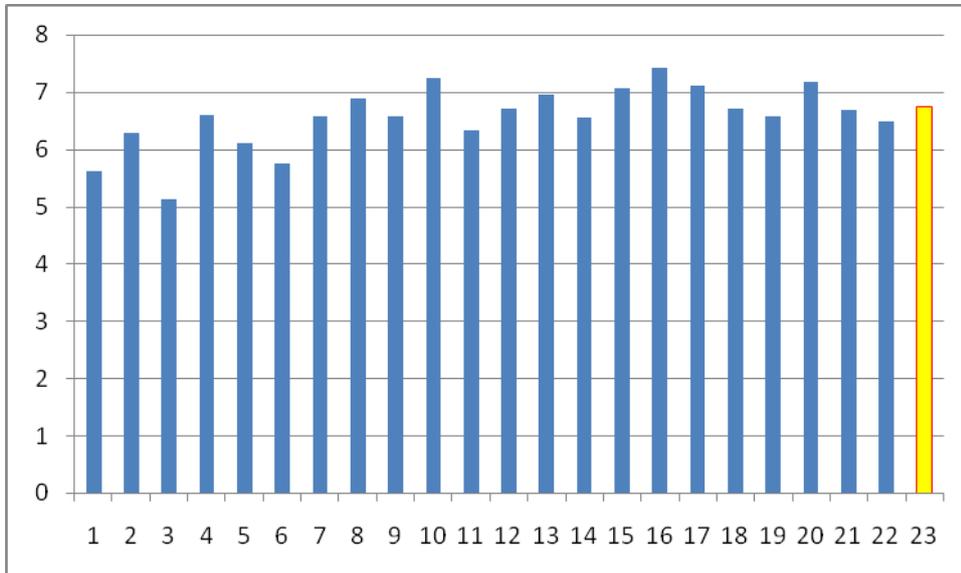


Figure 22: Prevalence of somatisation (%) by district

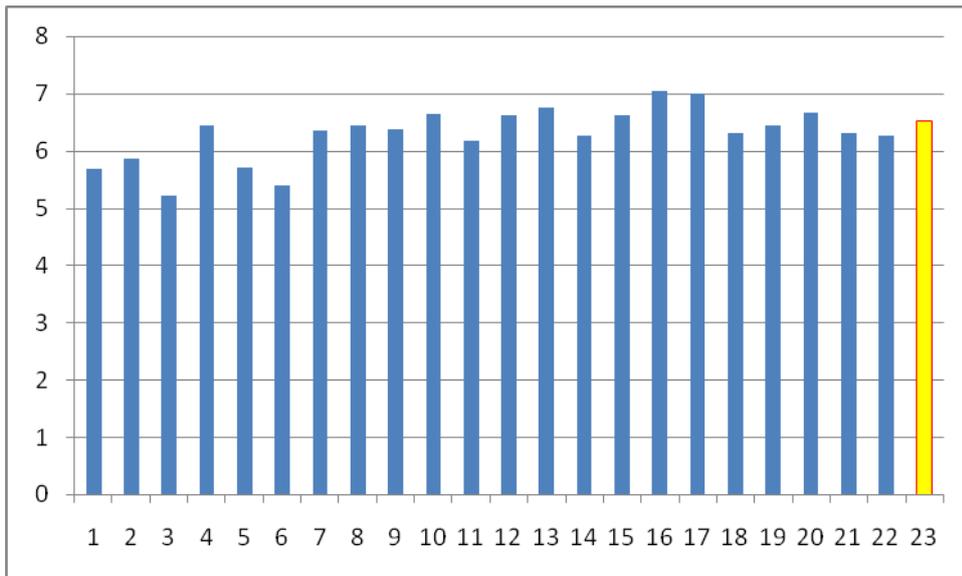
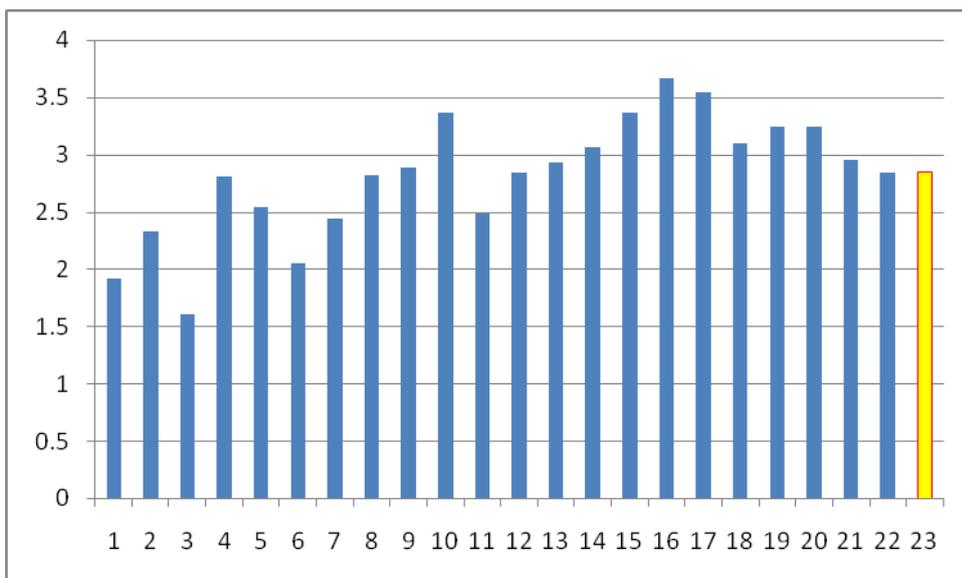


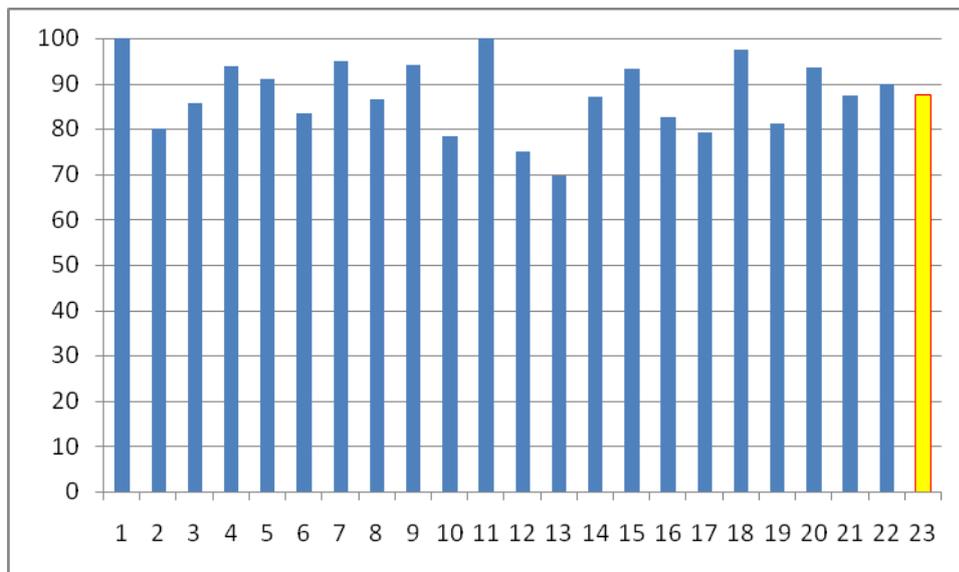
Figure 23: Prevalence of depression (%) by district



Vaccination

A vaccination questionnaire was completed for all children 0-23 months old, looking at the vaccination chart, or according to mother recall, if the card was not available. All antigens were questioned based on child's age. The prevalence of fully immunized children, 13 months old and older, is reported in Figure 24.

Figure 24: Fully immunized children over the age of one (%) by district

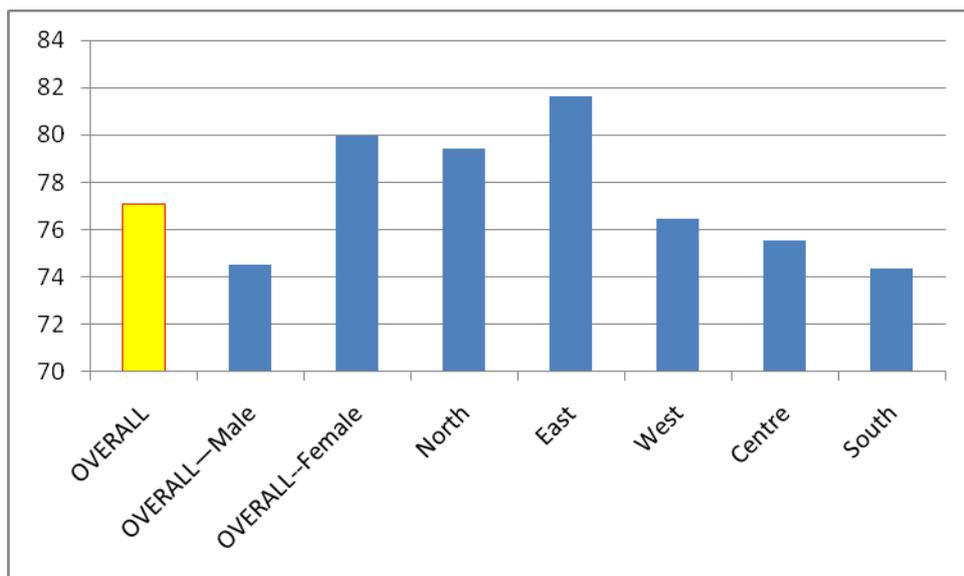


The uneven distribution of vaccination coverage across the districts of Tehran requires prompt action.

Life expectancy

Life expectancy at birth was calculated for Tehran as a whole, by sex, and also by the five city zones (Figure 25).

Figure 25: Life expectancy at birth in Tehran, by sex and by city zone



Economic domain

Household costs

In an innovative approach, a simple one-page questionnaire was exclusively developed for the Urban HEART pilot study, which included the main items of household costs such as health (Figure 26), education, transport, housing, insurance, energy, cultural, recreation (Figure 27), social, and personal costs and savings (and investments) during the prior year.

Health costs

Health costs consisted of average outpatient (medical visits), inpatient (hospitalization), medicine costs, transport to medical centres, diagnostic, rehabilitation and other relevant health costs. Some of the affluent areas (districts 1, 3 and 6) had substantially more health costs/expenditures than the less affluent areas (figures in the next charts are in Tomans, which is roughly equal to 0.001 US dollars)(Figure 26).

Figure 26: Annual household health cost by district

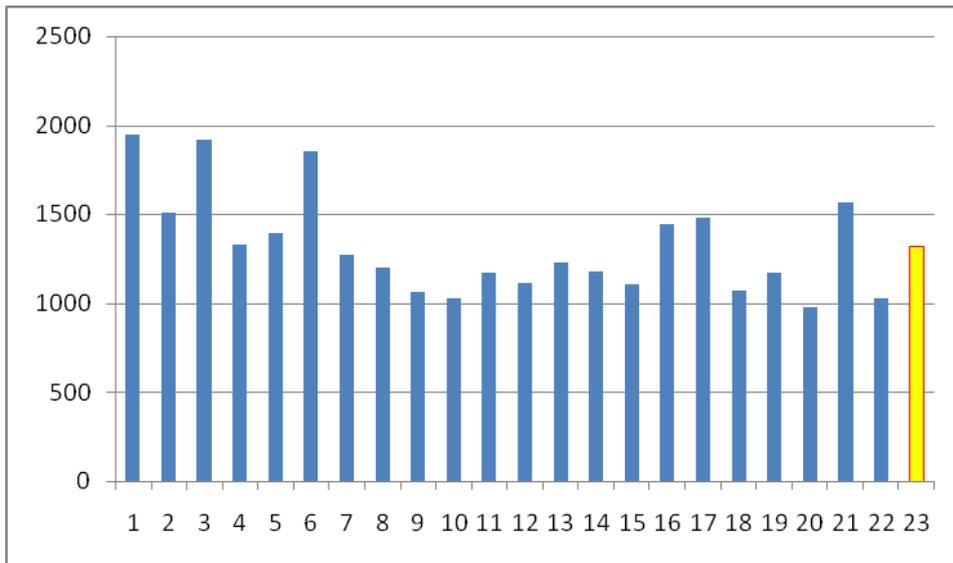
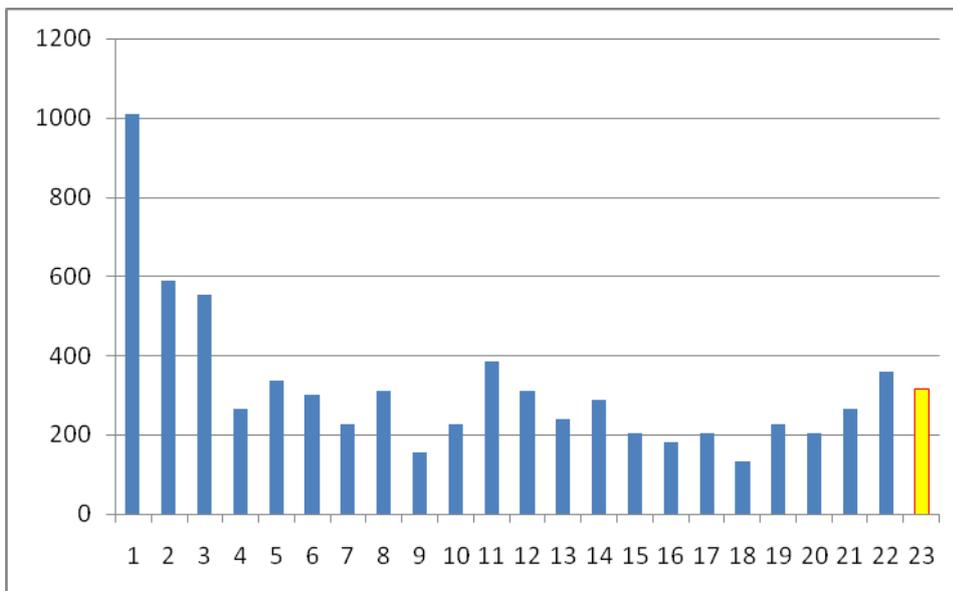


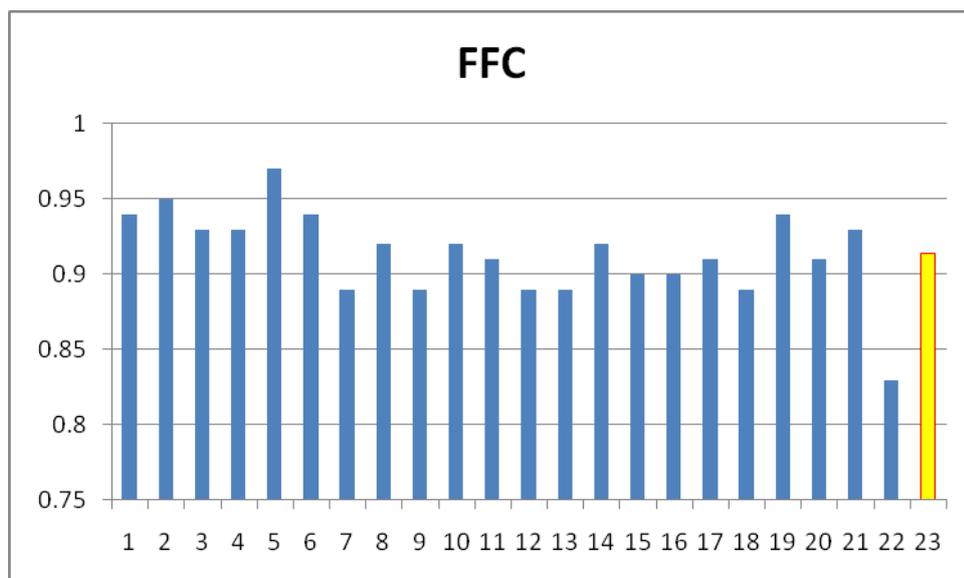
Figure 27: Annual household recreation cost by district



Fair Financial Contribution Index

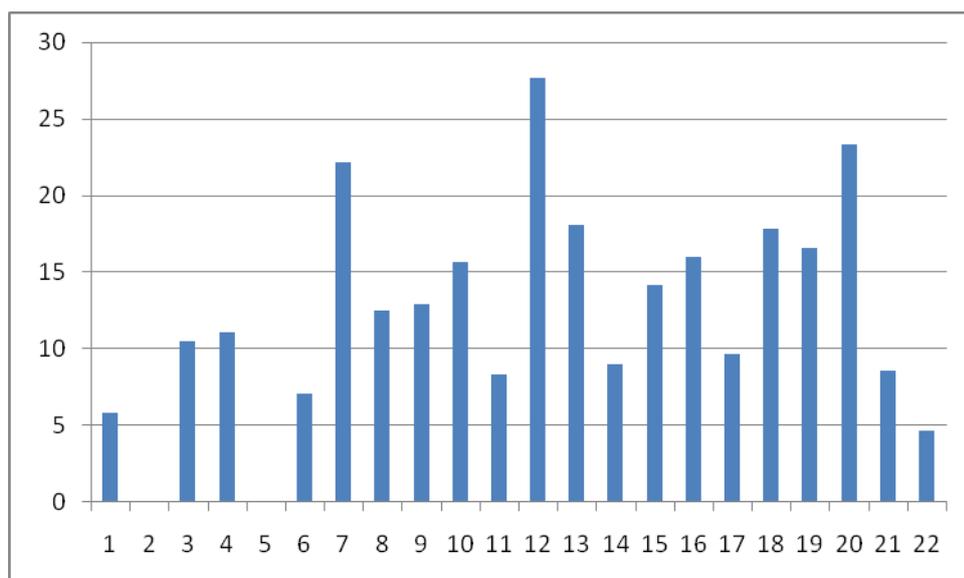
The Fair Financial Contribution (FFC) index is a fairly sophisticated formulae constructed to measure inequality in the distribution of household financial contributions, where a value closer to one indicates greater equality. It involves the calculation of a household's financial contribution to the health system measured as its total payments to the health system divided by its capacity-to-pay, defined as total consumption expenditure minus food expenditure. The national FFC figure was 0.836 in 2006; however, the average FFC in Tehran was 0.913, with significant variation among the districts (Figure 28).

Figure 28: Fair Financial Contribution (FFC) index by district



With the assumption that households with ‘health costs’ of more than 40% of their capacity to pay endure an unbearable economic situation (i.e. catastrophic payment for healthcare), we were able to calculate the proportion of households with catastrophic healthcare expenditure in most districts of Tehran (Figure 29). Due to insufficient data, these figures could not be calculated in two districts (districts 2 and 5).

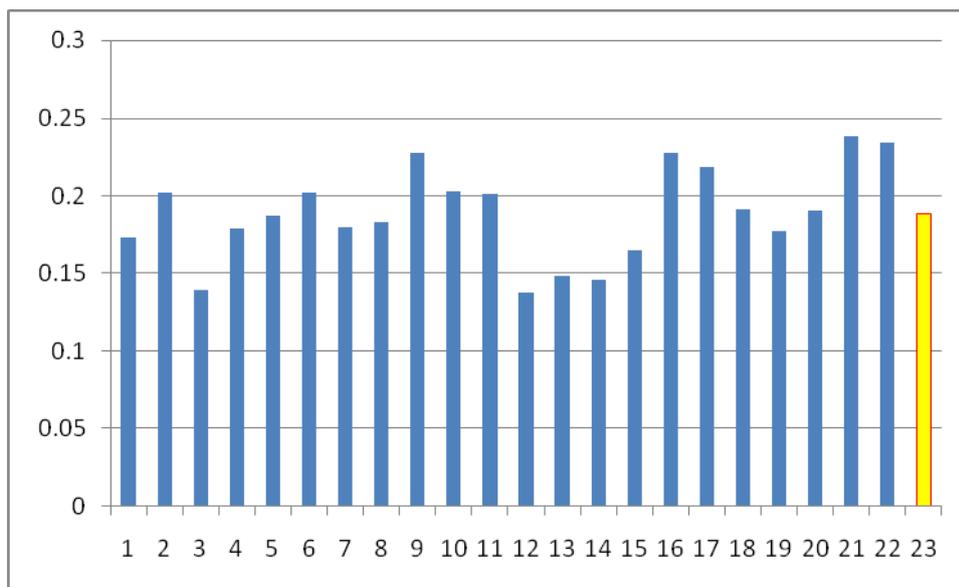
Figure 29: Catastrophic payment for healthcare



Employment status

According to the official definition by the Statistical Centre of Iran, employment status is estimated based on the population over 10 years old. However, we report the unemployment rate based on the population over 15 years of age, which varied across the districts of Tehran (Figure 30). The distribution of this indicator was similar to that of the rate of unemployment calculated based on the population over 10 years old.

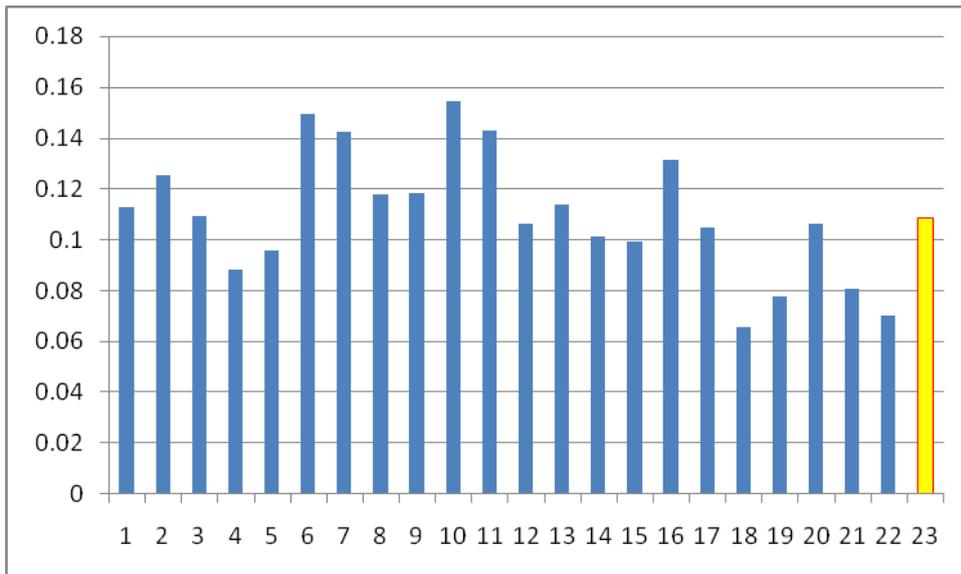
Figure 30: Unemployment rate among those 15 years and older, by district



Women-headed households

The distribution of women-headed households shows that such families are more common in some of the central districts (Figure 31).

Figure 31: Proportion of women-headed households by district

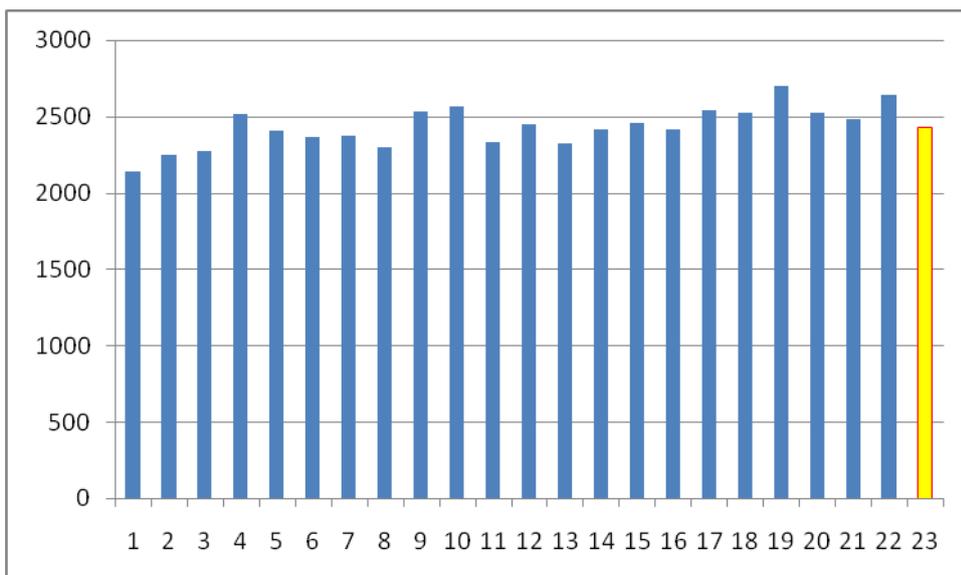


Nutrition domain

In a supplementary survey conducted on 2 300 households within all 22 districts of Tehran, a valid 24-hour food recall questionnaire was used by trained nutritionists to collect dietary data and also to measure anthropometric features of respondents during a 4-month period (September-December 2008). The sample was selected using a stratified (by each district) randomised cluster method based on the main Urban HEART survey sampling framework.

Calorie intake

Figure 32: Mean calorie intake by district



While all households had an average calorie intake of more than 2 100 kcal per person per day, people in the more advantaged zones (districts 1-3) had a mean calorie intake that was slightly less than that in the more deprived areas (districts 17-19).

The distribution of people beyond the two prominent cut-off points in energy intake, which are less than 70% and more than 110% of the recommended daily energy intake, are demonstrated in the following graphs (Figures 33 & 34).

Figure 33: Proportion of households above 110% of the recommended daily energy intake, by district

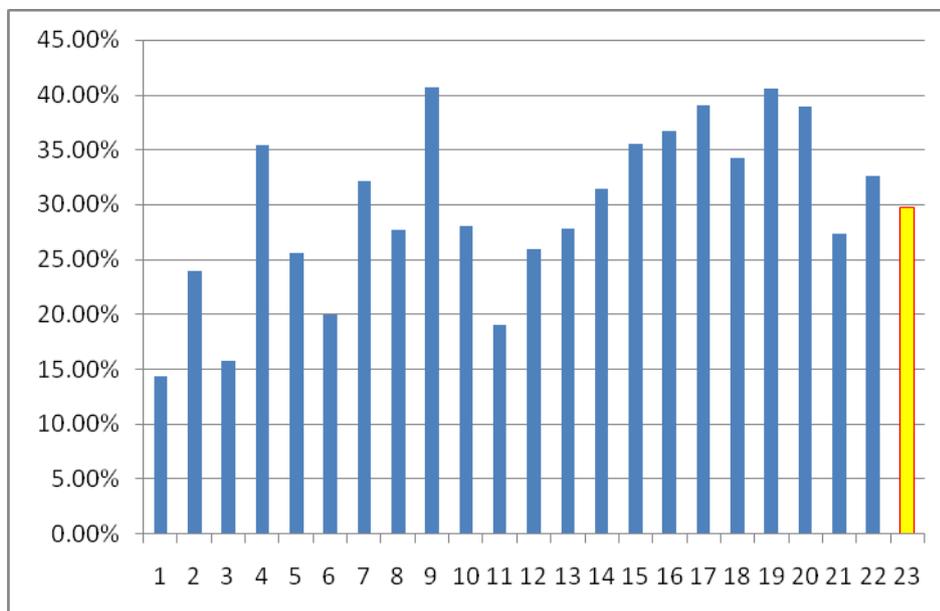
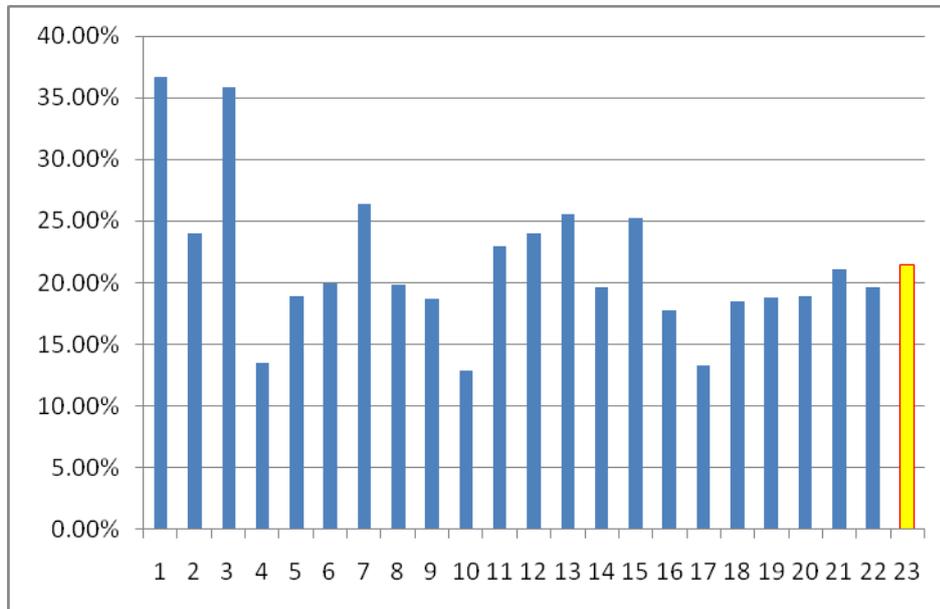


Figure 34: Proportion of households below 70% of the recommended daily energy intake, by district



Body Mass Index (BMI)

BMI was calculated using anthropometric parameters measured by trained interviewers. A BMI between 25-30 was considered as overweight (Figure 35) and more than 30 as obese (Figure 36).

Figure 35: Prevalence of overweight (BMI 25-30) by district

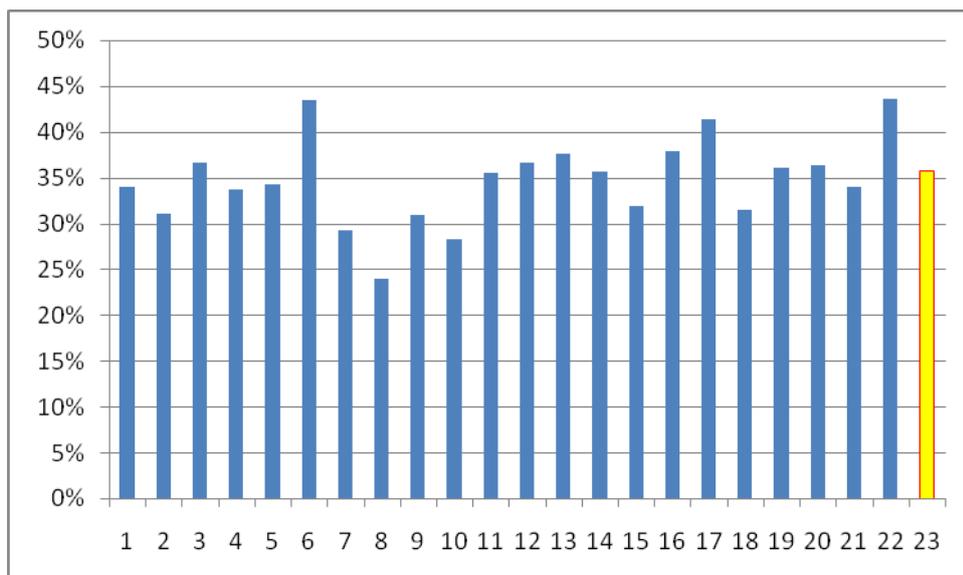
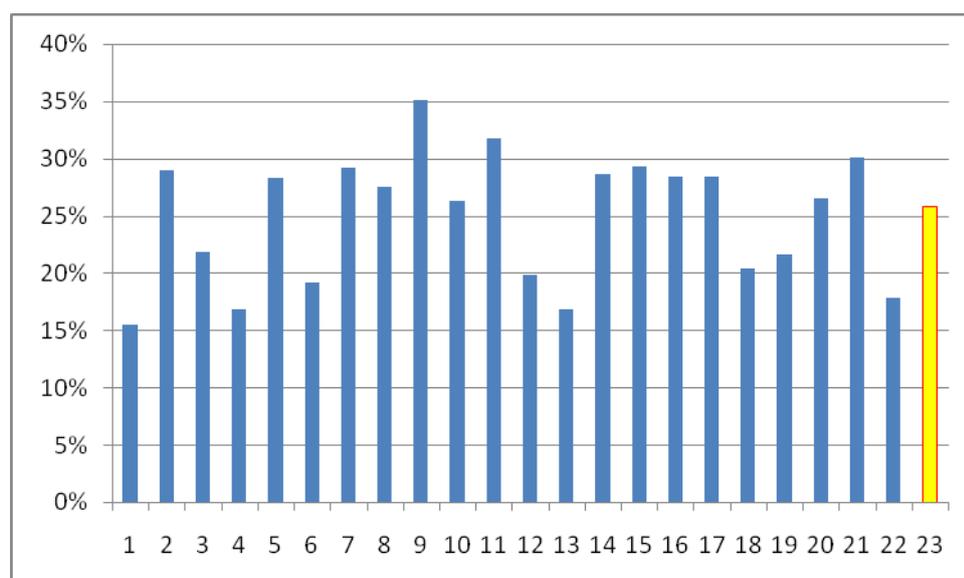


Figure 36: Prevalence of obesity (BMI over 30) by district



Mean consumption of meat intake

In the nutrition survey, we administered a 24-hour food recall survey. Mean consumption was calculated per major food group using a standard software (N-3), based on the food composition table and recommended daily allowance, which have been previously modified by the National Nutrition and Food Technology Research Institute (NNFTRI) of Iran.

Mean consumption was calculated for each of seven food groups which are cereals, fruits, vegetables, dairy, meat, oil, beverages, and carbohydrates. The food groups which provide calorie (bread and cereals, oil, and carbohydrates) were more likely to be consumed in disadvantaged districts, while in more affluent districts, meat and vegetable consumption were more prevalent.

Governance domain

Indicators selected in the governance domain addressed a wide variety of issues related to governance by the Municipality of Tehran, unlike the corresponding Urban HEART indicators which focused on governance issues related to the health sector. Specifically, 8 indicators were developed to measure transparency, annual reports by Municipality (within districts), satisfaction of citizens with Municipality services, lawfulness, responsiveness to residents' complaints (e.g. Hot Lines), community participation (local elections, financial), and standard activities. Among these, only

responsiveness (Figure 37) and responsiveness (Figure 38) were measured in the main Urban HEART survey.

Figure 37: Proportion of households familiar with Municipality hot-line, by district

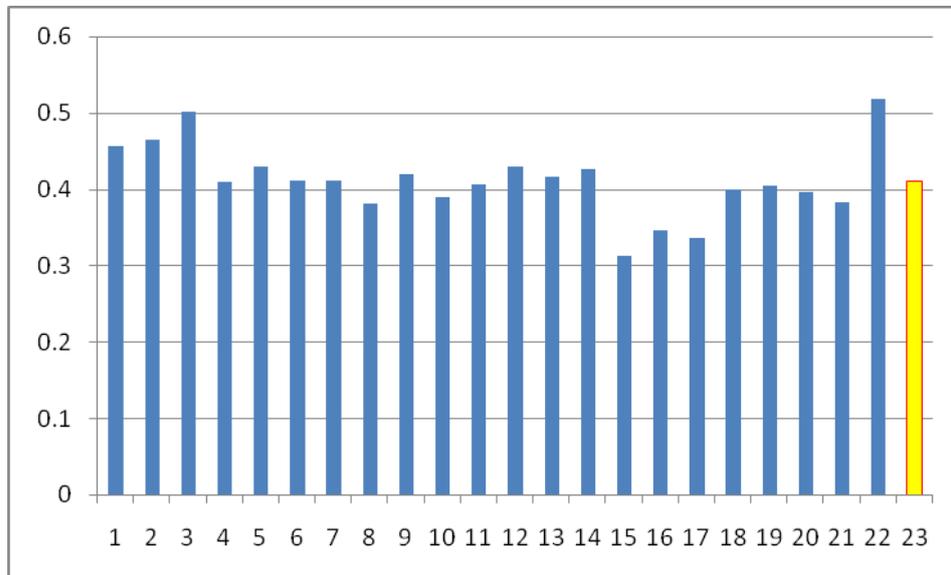
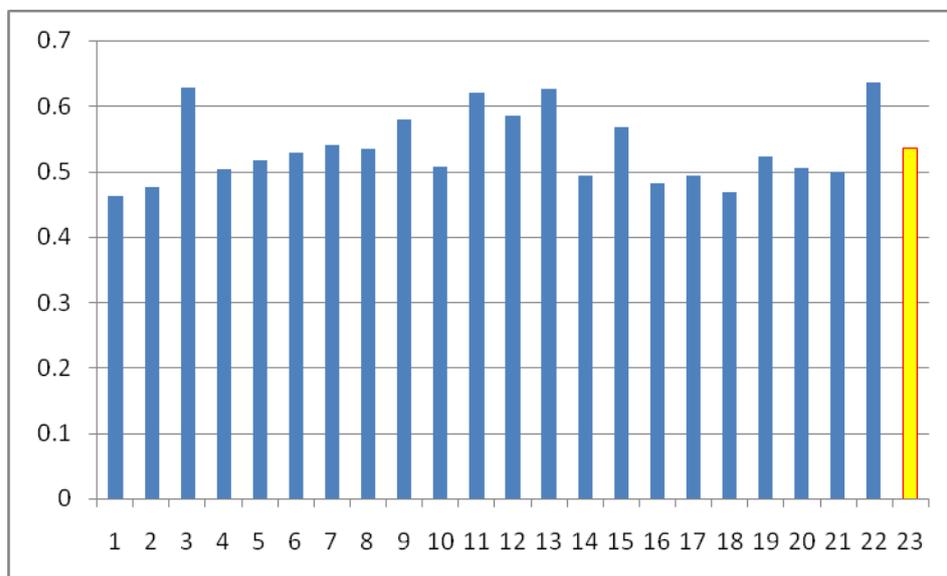


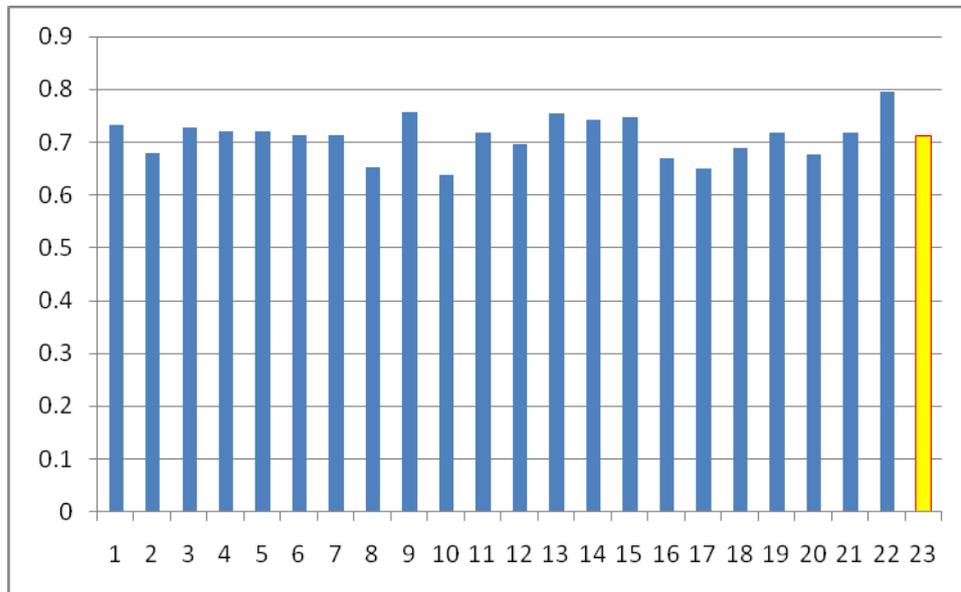
Figure 38: Proportion of households satisfied with Municipality hot-line, by district



Satisfaction with Municipality services

The overall satisfaction with the Municipality services was calculated using a series of questions. The results are shown in Figure 39.

Figure 39: Proportion of households satisfied with Tehran Municipality services, by district



Urban HEART Matrices

The health equity assessment results are summarized using Urban HEART's Matrix format in the following figures (Figure 40-45). Green cells indicate good performance, red cells poor performance, and yellow cells somewhere in between.

Figure 40: Household assets by district

Districts	Home ownership	PC	Family size	Piped water	Landline phone	Bath	Kitchen	Toilet	Cell phone	Freezer	Car	Gas supply
1	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Green	Yellow
2	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Yellow
3	Green	Green	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Green	Yellow
4	Yellow	Yellow	Yellow	Green	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Green
5	Yellow	Green	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green	Red
6	Green	Green	Green	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Yellow
7	Yellow	Yellow	Green	Green	Yellow	Green	Green	Green	Yellow	Yellow	Yellow	Yellow
8	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Green
9	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
10	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Green
11	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Green
12	Red	Yellow	Yellow	Red	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
13	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green
14	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green
15	Red	Red	Red	Yellow	Red	Yellow	Yellow	Yellow	Red	Red	Red	Green
16	Yellow	Red	Yellow	Yellow	Red	Red	Red	Red	Red	Red	Red	Green
17	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
18	Yellow	Red	Red	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Green
19	Yellow	Red	Red	Red	Red	Red	Red	Red	Yellow	Red	Yellow	Green
20	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Green
21	Green	Yellow	Red	Green	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow
22	Red	Yellow	Yellow	Yellow	Green	Yellow	Green	Green	Green	Yellow	Green	Yellow

Figure 41: Health outcomes indicators by district

District	Exclusive breastfeeding rate	Married (Under 18)	Suspected mental disorder	Child immunization	Elderly population (65+)	U-5 MR	NMR	IMR	Disability rate	Quality of life (Physical)	Life expectancy at birth	Safe delivery	Early pregnancy
1	Yellow	Yellow	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
2	Red	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Yellow	Green	Green	Green	Green
3	Red	Green	Green	Yellow	Red	Green	Green	Green	Green	Green	Yellow	Green	Green
4	Yellow	Green	Yellow	Green	Yellow	Yellow	Green	Red	Yellow	Green	Yellow	Green	Green
5	Yellow	Yellow	Green	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Green
6	Green	Green	Green	Yellow	Red	Red	Green	Red	Yellow	Yellow	Yellow	Green	Green
7	Yellow	Yellow	Yellow	Green	Red	Green	Green	Green	Yellow	Green	Green	Green	Green
8	Red	Green	Yellow	Yellow	Red	Red	Red	Green	Yellow	Green	Yellow	Green	Green
9	Yellow	Yellow	Yellow	Green	Yellow	Red	Green	Red	Red	Yellow	Red	Green	Green
10	Green	Yellow	Yellow	Red	Yellow	Green	Green	Green	Red	Yellow	Green	Green	Red
11	Yellow	Green	Yellow	Green	Yellow	Green	Green	Green	Yellow	Green	Green	Green	Green
12	Yellow	Red	Yellow	Red	Yellow	Red	Red	Red	Red	Red	Red	Green	Green
13	Green	Yellow	Yellow	Red	Yellow	Green	Green	Green	Yellow	Green	Yellow	Green	Green
14	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Green	Red	Yellow	Yellow	Green	Green
15	Yellow	Yellow	Red	Green	Yellow	Green	Green	Green	Yellow	Red	Red	Green	Green
16	Yellow	Yellow	Red	Yellow	Yellow	Red	Green	Red	Yellow	Red	Red	Green	Yellow
17	Yellow	Red	Red	Red	Yellow	Red	Green	Yellow	Red	Red	Green	Green	Yellow
18	Yellow	Yellow	Yellow	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Green	Yellow
19	Yellow	Red	Yellow	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green	Red
20	Yellow	Red	Red	Green	Yellow	Red	Green	Red	Red	Red	Yellow	Green	Yellow
21	Yellow	Yellow	Yellow	Yellow	Green	Red	Red	Green	Yellow	Yellow	Red	Green	Green
22	Green	Yellow	Yellow	Green	Green	Red	Green	Red	Green	Yellow	Yellow	Green	Red

Figure 42: Social and human development indicators by district

District	Violence rate	Severe violence rate*	Addiction rate	Higher education	Illiterate (15+ yo)	Traffic accidents	Voluntary help	Collective activities	Trust	Friendship and unity	Respect to values
1	Green	Green	Green	Green	Yellow	Green	Green	Yellow	Green	Green	Green
2	Yellow	Yellow	Green	Green	Green	Yellow	Green	Yellow	Green	Yellow	Red
3	Yellow	Yellow	Green	Green	Green	Green	Green	Yellow	Green	Green	Red
4	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow
5	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
6	Yellow	Yellow	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Red
7	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow
8	Green	Yellow	Red	Yellow	Yellow	Green	Green	Yellow	Green	Yellow	Yellow
9	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow
10	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
11	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
12	Red	Red	Red	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Green
13	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
14	Yellow	Yellow	Red	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow
15	Yellow	Yellow	Red	Red	Red	Red	Red	Yellow	Red	Red	Green
16	Yellow	Yellow	Yellow	Red	Red	Yellow	Red	Green	Red	Yellow	Yellow
17	Green	Yellow	Yellow	Red	Red	Yellow	Yellow	Green	Yellow	Yellow	Yellow
18	Yellow	Green	Yellow	Red	Yellow	Yellow	Red	Green	Red	Yellow	Green
19	Red	Red	Yellow	Red	Red	Yellow	Red	Green	Red	Red	Yellow
20	Red	Yellow	Red	Yellow	Red	Yellow	Red	Yellow	Red	Red	Green
21	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green
22	Green	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow

- Severe violence: Verbal violence excluded

Figure 43: Smoking and mental health indicators by district

District	Family Smoking rate	Male current smoking rate %	Female current smoking rate %	Female youth (13-18 yo) current smoking rate %	Male youth (13-18 yo) current smoking rate %	Suspected mental disorder	Somatisation	Anxiety	Functioning	Depression
1	Green	Green	Red	Red	Green	Green	Green	Green	Green	Green
2	Yellow	Yellow	Red	Green	Yellow	Yellow	Green	Yellow	Green	Yellow
3	Green	Green	Red	Green	Yellow	Green	Green	Green	Green	Green
4	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
5	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow
6	Yellow	Yellow	Red	Red	Yellow	Green	Green	Green	Green	Green
7	Red	Red	Red	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
8	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow
9	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
10	Red	Red	Yellow	Yellow	Red	Yellow	Yellow	Red	Yellow	Red
11	Red	Red	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow
12	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow
13	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
14	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
15	Red	Yellow	Yellow	Red	Yellow	Red	Yellow	Yellow	Yellow	Red
16	Red	Yellow	Yellow	Green	Green	Red	Red	Red	Red	Red
17	Red	Red	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow	Red
18	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
19	Red	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
20	Yellow	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow	Red	Yellow
21	Yellow	Yellow	Green	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow
22	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow

Figure 44: Economic indicators by district

District	Male (10+ yo) unemployment rate	Female (10+ yo) unemployment rate	10-15 yo employment rate	FFCI	Catastrophic costs	Un-insured family head	Non Food Costs	Food costs	Proportion of Non-Food Costs to total costs	Person per room	Area per capita	Resident in normal home
1	Green	Yellow	Yellow	Green	Yellow	Yellow	Green	Yellow	Green	Yellow	Green	Green
2	Yellow	Yellow	Yellow	Yellow	Green	Green	Green	Green	Green	Yellow	Green	Green
3	Green	Yellow	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow	Green	Green
4	Yellow	Yellow	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow
5	Yellow	Yellow	Green	Yellow	Green	Green	Yellow	Green	Yellow	Yellow	Green	Green
6	Yellow	Red	Green	Green	Yellow	Yellow	Yellow	Green	Yellow	Green	Green	Green
7	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow
8	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
9	Red	Red	Green	Yellow	Yellow	Yellow	Red	Yellow	Red	Yellow	Yellow	Yellow
10	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
11	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Green	Yellow	Yellow	Yellow
12	Green	Green	Red	Yellow	Yellow	Red	Yellow	Yellow	Red	Yellow	Yellow	Yellow
13	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
14	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
15	Yellow	Green	Yellow	Red	Yellow	Red	Red	Red	Yellow	Red	Red	Yellow
16	Red	Yellow	Yellow	Red	Red	Yellow	Red	Red	Yellow	Red	Red	Red
17	Red	Green	Yellow	Red	Red	Red	Yellow	Yellow	Red	Red	Red	Red
18	Yellow	Yellow	Green	Red	Yellow	Yellow	Red	Yellow	Red	Red	Red	Yellow
19	Yellow	Yellow	Green	Red	Yellow	Red	Red	Yellow	Yellow	Red	Red	Red
20	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Red	Red	Red	Yellow	Yellow	Yellow
21	Red	Red	Green	Yellow	Red	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
22	Yellow	Red	Green	Yellow	Green	Green	Yellow	Green	Yellow	Yellow	Yellow	Green

Figure 45: Governance indicators by district

District	Satisfaction with Municipality services	responsiveness	Hotlines	Transparency	Participation	Lawfulness
1	Yellow	Yellow	Green	Yellow	Red	Green
2	Red	Yellow	Green	Yellow	Yellow	Yellow
3	Yellow	Green	Green	Yellow	Green	Yellow
4	Yellow	Yellow	Yellow	Yellow	Green	Red
5	Yellow	Yellow	Yellow	Red	Yellow	Yellow
6	Yellow	Yellow	Yellow	Yellow	Red	Yellow
7	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
8	Red	Yellow	Yellow	Yellow	Yellow	Yellow
9	Green	Yellow	Yellow	Yellow	Yellow	Yellow
10	Red	Red	Yellow	Yellow	Yellow	Green
11	Yellow	Yellow	Yellow	Yellow	Red	Yellow
12	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
13	Green	Yellow	Yellow	Yellow	Yellow	Yellow
14	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
15	Yellow	Red	Red	Red	Yellow	Yellow
16	Red	Red	Red	Green	Green	Yellow
17	Red	Red	Red	Yellow	Yellow	Yellow
18	Yellow	Red	Yellow	Yellow	Yellow	Yellow
19	Yellow	Yellow	Yellow	Red	Red	Yellow
20	Red	Yellow	Yellow	Green	Yellow	Yellow
21	Yellow	Red	Yellow	Green	Yellow	Red
22	Green	Green	Green	Green	Green	Yellow

The way forward

The second part of Urban HEART, which is 'response', indicates that findings from the 'assessment' part should be incorporated into practice to reduce inequalities. Four approaches were defined by the team in Tehran for the 'response' part:

- 1- Evidence-based policy making:
 - a. Endorsement of 'five-year development plan of Tehran' in early 2009 by the City Council, which accommodated three articles regarding annual assessment of inequalities in health and social determinants within Urban HEART policy domains.
 - b. Initial reports to the City Council in early 2009 led to redistribution of budget for the succeeding fiscal year, which targeted deprived districts of Tehran.
 - c. Official reports were delivered to different Commissions in the Parliament, which led to the suggestion by the Health Commission that 'health equity indicators' should be considered in the Fifth Five-Year Development Plan.
 - d. According to the findings from Urban HEART, 'health equity indicators' are going to be integrated into the PHC information system in urban, suburban, and rural areas to be monitored routinely. The National Health Inequality Monitoring System, jointly supported by the Ministry of Health and World Health Organisation, will be mostly based on 'surveillance' which collects data through different registries in relevant sectors.
- 2- Evidence-based practice: This encompasses local plans within districts to improve the inequality status compared to other districts and also to reduce the gaps inside the district.
- 3- Inter-sectoral collaboration: The project findings were reported to relevant organizations to obtain their support to reduce the gaps within districts and neighbourhoods. This is an ongoing process.
- 4- Community Based Initiatives (CBI): Findings from each district has been analysed to be reported to district mayors, neighbourhood councils and local

authorities to choose their own priorities for inequality reduction. The CBI project is going to be conducted during 2010.

In accordance with the City Council Act, the Municipality of Tehran is planning the second round of inequality assessment in 2010. The 'response' part of the first assessment is also planned by Department of Health at the Municipality to be conducted using CBI approach in different districts of Tehran.

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