

האוניברסיטה העברית בירושלים
The Hebrew University of Jerusalem



המרכז למחקר בכלכלה חקלאית
The Center for Agricultural
Economic Research

המחלקה לכלכלה חקלאית ומנהל
The Department of Agricultural
Economics and Management

Discussion Paper No. 4.04

Gender Differences in Health and Nutrition
in Southern Ethiopia

by

Ayal Kimhi

Papers by members of the Department
can be found in their home sites:

מאמרים של חברי המחלקה נמצאים
גם באתרי הבית שלהם:

<http://departments.agri.huji.ac.il/economics/indexe.html>

P.O. Box 12, Rehovot 76100

ת.ד. 12, רחובות 76100

Gender Differences in Health and Nutrition in Southern Ethiopia

by

Ayal Kimhi
Department of Agricultural Economics
Faculty of Agriculture
The Hebrew University
Rehovot, Israel
kimhi@agri.huji.ac.il

March 2004

Summary

This paper examines the health and nutritional status of Ethiopian families with a particular aim of investigating the differences between males and females and identifying the sources of these differences. In our sample of Enset-growing communities, gender roles seem to be quite separate. While both males and females engage in the cultivation and processing of Enset, males do most of the cultivation and females do most of the processing. Females have a higher tendency to engage in non-agricultural income-generating activities than males, but they mostly do crafts for sale while most males engage in trading activities. The earnings of females are much lower than those of males. This may be due to their much lower educational attainment. Females are also responsible for most household-production activities such as gathering firewood, carrying water and childcare.

The different roles assumed by males and females could affect intra-household resource allocation in several ways. First, the household could allocate resources according to need, and need varies by the activities in which household members engage. Second, gender roles could affect the bargaining power of males and females within the household, thereby affecting the sharing rules.

Our data set includes individual information on nutritional intakes, as well as objective and subjective measures of health. Despite the extremely specialized gender roles in household production, food production and processing, and market activities, we found relatively little gender differences in health and nutrition. In particular, we found little if any gender differentials in the allocation of calories within the household, even after accounting for differential calorie requirements. However, the nutritional status of females, as reflected in their BMI, seems to deteriorate with age relative to that of males. With respect to health, no significant gender differences were found in the incidence of disabilities and the difficulty of performing Activities of Daily Living. However, females in our sample seem to suffer more frequent illnesses and somewhat less access to treatment than males.

I wish to thank Abebe Bekele, Nathan Sosner and Asghar Zaidi for collaborating in earlier phases of this research, and Naomi Trostler and John Komlos for helpful suggestions. The research was supported by a grant from NIRP, the Netherlands-Israel Development Research Programme, and by the Center for Agricultural Economic Research.

Introduction

Health and nutrition are important elements in the development process. Adequate nutrition enhances physical health, thereby improves labor productivity. Good nutrition is also associated with learning ability, hence nutrition could lead to higher human capital accumulation (Schultz, 1997). Both nutrition and health increase life expectancy which is known to be important for development (Cervellati and Uwe, 2002). Ersado, Amacher and Alwang (2003) found that health enhances agricultural technology adoption in Ethiopia. The literature on health, nutrition and economic development has been surveyed by Behrman and Deolalikar (1988), and more recently by Strauss and Thomas (1998).

Gender differences in health and nutrition could be due to biological differences, but also to differences in nutritional requirements as a result of different physical activities. In addition, these differences can be the result of intrahousehold resource allocation processes (Bolin, Jacobsson, and Lindgren, 2001). Ghosh and Kanbur (2003) showed that in the presence of specialization of males and females in different activities, an increase in male wage could make females worse off. In India, for example, gender differences are thought to be a consequence of the dowry system (Haddad et al., 1996). Although much smaller gender differences are observed in other developing countries, Fafchamps and Quisumbing (2003) found gender differences in rural Ethiopia and showed that they are determined to a large extent by the marriage market.

This paper deals with gender differences in health and nutritional status in Southern Ethiopia. Drawing on a unique data set that includes individual information on nutritional intakes, as well as objective and subjective measures of health, we analyze the potential impact of differential gender roles in household production, food

production and processing, and market activities, on the gender differences in health and nutrition. We start with a description of the gender roles as reflected in our data, and then move to analyze nutritional status and finally health status of males and females.

The population and the data

The data used in this research was collected through a household survey, which was conducted during January-March of 1995 in the Ejana-Wolene, one of the sub-districts of the Gurage administrative zone, in the Southern region of Ethiopia. Ejana Wolene is a rural area located 240 km South of Addis Ababa, the capital of Ethiopia (figure 1). According to 1995 district administration records, total population was estimated to be 217,840. Ensete (false banana) is the major crop and food source in the region, and is grown by most households on small plots around the house. Ensete has a six-year growing cycle in which it is transplanted three or four times (Pijls et al., 1995). Men are responsible for transplanting and harvesting. Women then scrape the pseudostem in order to separate the starchy pulp from the fiber, and grind the tuber. These activities are performed in the field. The pulp is fermented and stored in earthly pits for a period lasting from a few days to five years. Kocho, a sour starchy food, is prepared from the fermented pulp (Wussa). Kocho can be baked as bread. Wussa can also be served as crumbs fried or roasted with spices. Freshly harvested tuber is eaten after boiling. Bulla, a refined freshly harvested pulp, is consumed on special occasions.

Nineteen peasant associations out of the sixty-five peasant associations in the district were selected for the survey. Selection was based on accessibility and on an attempt to represent the diverse agro-economical conditions of the district. A total of 583 households were surveyed, about 31 in each of the 19 peasant associations (an average

peasant association in Guragie includes around 400 households). In each peasant association the households were chosen at random with the assistance of the local chief. An enumerator was instructed to physically measure the food intakes of all household members during three consecutive days. During this period he also had to administer a questionnaire, which included questions about personal and family characteristics, food production and expenditures, income and assets, health, and time allocation.

Gender roles

In this section we describe the different roles assumed by males and females in the generation of household income. Gender roles could be the outcome of either social norms and institutions or maximizing behavior, or both (Kevane, 2004, p. 67-68). As mentioned earlier, Ethiopian males and females have separate tasks in Ensete cultivation, harvesting and processing. When asked about main activity, 73% of the males older than 16 years of age in our sample defined themselves as farm workers (versus less than 1% of the females), whereas 91% of the females in the same age group defined themselves as domestic workers (verses less than 2% of the males). Other main activities are also extremely segregated by gender. 17% of the males defined themselves as traders versus 3.5% of the females. Other male-dominated activities are party official and administrator, teacher, and manual worker. Other female-dominated activities are craft worker and food seller.

The time allocation module of our survey reveals further differences in the roles assumed by males and females. Figure 2 shows the allocation of time among tasks in the day prior to the survey. Agricultural work is extremely dominated by males. Although males spend more time in domestic work than in agricultural work, females spend almost twice as much time in domestic work than males. Females also spent twice as

much time in other income generating activities than males. It should also be noted that females spend more time than males on all these activities altogether. The difference between males and females in the total time spent on these activities become larger when we look at the time allocation in the week prior to the survey, although the relative shares of the different activities display similar gender differences.

The different roles assumed by males and females as documented with the time allocation data is sufficient to generate gender differences in nutrition and health outcomes, due to the different energy requirements of the different tasks. However, these gender differences could be augmented or reduced as a result of intrahousehold allocation rules. Bargaining models of household behavior emphasize the role of threat points in the resource allocation decision. The theory implies that a household member with a better alternative could extract a larger portion of the limited household resources. A better alternative could be a result of earning capacity. Hence, we would like to examine whether there are gender differences in earning capacity in our survey population.

One of the determinants of earning capacity is human capital. It has been shown before that schooling is one of the important determinants of bargaining power in developing countries (Quisumbing and Maluccio, 2000). In figure 3 we compare educational attainment of adult males and females in our sample. The differences cannot be overlooked: only 15% of the females have any level of formal schooling, while more than half of the males do. We now move on to examine gender earning differentials.

We have seen that males specialize in agricultural work and females specialize in domestic work. Most of agricultural production is performed on the household plot and intended for self consumption. Despite that, we have estimates of the value of agricultural production. However, it is impossible, using our data, to value domestic

work. Hence, we ignore these specialized activities and focus instead on earnings from other activities for which more direct measures of wages or self-employment income are available. We include agricultural work on other farms among these income generating activities. This increases significantly the sample of males for which we can observe income.

What we call wage here is in fact the total annual income derived from one or more of the income generating activities for each individual divided by the total number of days spent by this individual in these activities. One problem we encounter with this calculation is that part of the income is received in kind, and we have to transform quantities of goods into their value. For this purpose, we have derived average price per unit of crops using three sources of information: crop sales data, food expenditure data, and data from a market survey that was conducted separately. After struggling with comparisons of various units of measurement, we came up with prices that were more or less consistent across the three sources of data. Even after imputing income with these prices, we still have a few cases in which income in kind could not be computed, and these are left out of the calculation. Therefore, we underestimate income for about 5% of the individuals in the sample. We have no indication whether this biases the gender wage differences in a particular direction.

Another data problem is that in about 7% of the cases, income was generated by more than one individual. In this case we simply divide the income equally among the individuals involved. This can result in a lower gender earnings gap, but the magnitude could not be large. After completing these calculations, we found that the average daily wage for a male worker was almost 90% higher than the average daily wage for a female worker. This implies that even if a male and a female are equally sharing tasks in and out of the household, the bargaining power of males is likely to be higher and hence the

allocation of resources within the household is likely to be biased towards males. It should be noted that Appleton, Hoddinott and Krishnan (1999) found a much smaller gender wage gap in urban Ethiopia.

Nutritional status

In this section we examine gender differences in nutritional intakes. One of the special features of our data set is that food intakes are directly measured at the individual level. The preferred method of measuring food intakes is direct weighing of servings, because of the measurement errors involved in recall and expenditure methods (Bouis, Haddad and Kennedy, 1992). This method has been used before in Ethiopia (Ferro-Luzzi et al., 1990) and elsewhere (Senauer, Garcia and Jacinto, 1988; Gawn et al., 1993), and proved useful. In this survey, the method was applied by first documenting the ingredients of every dish prepared, then weighing each plate of food before it was served, and finally weighing the empty plate (including left-overs) again after the meal. The enumerator also indicated which household members ate from each plate measured. It should be noted that the most common Ethiopian food, Enjera, is served in communal plates and in this case it is impossible to document individual intakes. In Ensete-growing communities, however, Kocho is mostly served in individual plates and this enables individual measurement. In addition to the direct measurement, household members were asked to provide information about food they ate outside the household.

Calorie content of each dish was calculated according to food composition tables available for Ethiopia. Individual daily calorie intakes were calculated by first aggregating over all food items eaten by each individual (plates were equally divided when two or more individuals shared them) and then averaging over the three observation days. As a whole, the measured daily calorie intakes seem fairly low. This is

especially worrisome given that the Body Mass Index (BMI) of the sample population indicates quite normal long-run nutritional status. Calorie intakes are probably biased downwards due to several reasons. First, calorie intakes are positively related to the number of meals per day, which indicates a possible bias caused by unreported food, presumably eaten between regular meals. Second, in many occasions enumerators did not specify the ingredients of certain dishes in a way that is detailed enough to allow for the evaluation of calorie contents. More than one third of the people in the sample had eaten from at least one dish that was not described adequately, during the three-day survey. Obviously, our measures of calorie intakes do not include these dishes.

For each individual, we calculate the share of calorie intakes out of the total household calorie intakes. This is shown in figure 4. We observe that in some age groups females consume relatively more calories than males, while in other age groups males consume relatively more calories than females. Given the measurement errors, we conclude that there are no systematic differences between the relative calorie intakes of males and females. Recall, however, that this does not mean that males and females are equally adequately nourished. It could be that the energy requirements of males and females are different, due to several causes. First, metabolic differences cause gender differences in resting energy expenditures. Second, we have seen that daily activities are extremely differentiated by gender, and this may lead to different energy requirements due to the different energy requirements of the different activities. Third, females who are pregnant or breastfeeding require more energy in order to sustain their physical status. Hence, we move on to measure calorie intakes relative to calorie requirements.

Recommended Dietary Allowances (RDA) were calculated using tables in National Research Council (1989), according to gender, age, physical activity, pregnancy and lactation. Four alternative values were calculated using four different

ways to weight physical activities, but the differences were rather small. Details of the calculations can be found in Kimhi and Sosner (2000). Nutrition Adequacy Ratio (NAR) was computed by dividing daily calorie intakes by RDA. NAR was then aggregated by household, and the relative individual NAR were computed by dividing individual NAR by household NAR. The gender differences in relative NAR are shown in figure 5. We see that accounting for individual energy requirements does not change the previous observation that we cannot find systematic gender differences in nutritional intakes.

Another measure of nutritional status is Body Mass Index (BMI). BMI is defined as weight (in kilograms) divided by height (in meters) squared. Shetty and James (1994) claim that it is a good measure for chronic energy deficiency for adults (see also de Vasconellos, 1994). According to these studies, BMI over 18.5 indicates normal long-run nutritional status. Figure 6 shows that the long-run nutritional status of adults in our sample is quite normal. About 30% of males and 28% of females are chronically malnourished ($BMI < 18.5$), slightly higher than the figure for rural Ethiopia as a whole as reported by Dercon and Krishnan (2000). More importantly, there are no observable differences in nutritional status between males and females. However, figure 7 shows that the age profiles of BMI vary by gender. Young females have a higher BMI than males of the same age group, while older females have lower BMI than males of the same age group. Anson, and Sun (2002) observed a somewhat similar pattern of gender health differentials in rural China. We can only speculate that this may be a result of female deprivation throughout their adult life.

Health outcomes

Health is a function of nutritional status, but not only of nutritional status. Other factors such as the availability, the quality and the cost of health care services,

living standards, sanitary conditions, the quality of drinking water, and even psychological stress, all linked to income, are also important (Case 2002). Although we could not find gender differences in nutritional status, gender differences in health outcomes could result from unequal availability of these other factors for males and females within the household.

Our survey includes both subjective and objective measures of health and physical fitness (Kimhi 2003). The obvious objective measure is BMI which was discussed earlier, and did not show any gender differences. The subjective measures rely on questions about disabilities or major chronic health problems, and the difficulties in performing Activities of Daily Living (ADL). Three ADLs were included in the survey: walking for 5 kilometers, carrying 20 liters of water for 20 meters, and hoeing a field for a morning. Additional health measures are days of illness and days in which the person could not perform his/her main activity, in the preceding month. These illness measures are in part objective, but only in part, because the threshold by which a person declares himself ill or not could vary from person to person.

First, we examine the difficulties in performing Activities of Daily Living (ADL). Figure 8 shows that there are no marked gender differences in the level of difficulty of walking and carrying water. However, it is easily seen that females find it more difficult than males to hoe in the field. Of course, this is a reflection of gender differences in physical strength. The absence of gender differences in performing the easier tasks supports the hypothesis of the absence of gender differences in health.

Looking next at the disability data, we find that while 12% of the females declare themselves as disabled, only 10% of the males do so. This does not necessarily mean that females are less healthy than males, because one has to consider

the type of disability. It could be, for example, that males are more exposed to physical risks at work than females because of the extreme gender differences in tasks discussed earlier. The distribution of types of disabilities by gender is shown in figure 9. We observe different dominant types of disabilities for males and females. Females suffer more from poor eyesight and heart problems, while males suffer more from poor hearing and walking difficulties. But the largest gender difference is the much larger number of females that suffer from chronic headaches. Taking out this type of disability, the fractions of males and females that are disabled become very much the same. Chronic headache is definitely a type of disability that is suspect of reporting heterogeneity. Hence, we conclude that it is difficult to identify gender differences with respect to the fraction of disabled persons, although the types of disabilities seem to vary by gender.

Finally, we look at the days of illness and inability to perform the main activity. Only 10% of the males reported any illness in the preceding month, while 12% of the females did. The average days of illness (conditional on being ill) were roughly the same for males and females, though (12.4 days per month for females versus 12.3 for males). Of those who were ill, 18% of the females and 22% of the males could still perform their main activity throughout the month. On average (conditional on illness), females could not perform their main activity for 7.91 days, while the corresponding figure for males was 8.02 days. Excluding the pregnant females did not change these numbers in a significant way.

In order to assess whether there are gender differences in the severity of illnesses, we examine the symptoms reported by the ill individuals (figure 10). Similar to the case of disabilities, we find that females have a much higher tendency to report headaches, back pain and weakness. These are symptoms that are likely to be subject

to reporting heterogeneity. We also examine health expenditures of the ill individuals. We find that while only 25% of the ill males made any expenditure on medicines, 29% of the ill females did. The average amount spent on medicines (conditional on spending) was almost the same for males and females, though. However, 26% of the ill males and 22% of the ill females consulted a health professional about their illness. Asked about the reasons for not seeking treatment, a larger fraction of the females indicated reasons related to the cost of health care. This could be due to within-household discrimination against females in the allocation of resources. Of the ill persons that sought treatment, males tended to go to government or NGO facilities, while females tended to go to private facilities or traditional healers. Females had to travel to the health facility 134 minutes on an average trip, while males had to travel only 94 minutes on average. The cost of treatment was roughly the same for males of females.

The conclusion is that the direct illness questions reveal that females tend to be more ill than males, and that females tend to seek more expensive treatments (at least with respect to forgone time) than males. Perhaps there is discrimination against females in public health facilities. Despite the illness differentials, we could not identify systematic gender differentials in the normal physical status as reported by the ability to perform ADL and in the total incidence of disabilities.

Summary and conclusions

We have examined gender differences in health and nutritional status in Southern Ethiopia. We have used a unique data set that includes individual information on nutritional intakes, as well as objective and subjective measures of health, time allocation and income. We have found that gender roles in household

production, food production and processing, and market activities, are extremely specialized. Despite that, we found relatively little gender differences in health and nutrition. Specifically, the nutritional status of females, as reflected in their BMI, seems to deteriorate with age relative to that of males. Females also seem to suffer more frequent illnesses and somewhat less access to treatment.

The evidence presented here is not sufficient in order to trace the sources of gender differences or to make assessments about their welfare implications. However, they do point some interesting avenues for further research on these issues in rural Ethiopia and elsewhere.

References

Anson, Ofra, and Shifang Sun. "Gender and Health in Rural China: Evidence from HeBei Province." *Social Science and Medicine* 55, 202, 1039-1054.

Appleton, Simon, John Hoddinott, and Pramila Krishnan. "The Gender Wage Gap in Three African Countries." *Economic Development and Cultural Change* 47, January 1999, 289-312.

Behrman, Jere R, and Anil B. Deolalikar. "Health and Nutrition." In *Handbook of Development Economics* Vol. 1, edited by Hollis Chenery and T.N. Srinivasan. Amsterdam: North Holland, 1988.

Bouis, Howarth, Lawrence Haddad, and Eileen Kennedy. "Does it Matter how we Survey Demand for Food? Evidence from Kenya and the Philippines." *Food Policy* 17, October 1992, 349-360.

Bolin, Kristian, Lena Jacobsson, and Bjorn Lindgren. "The Family as the Health Producer – When Spouses are Nash-Bargainers." *Journal of Health Economics* 20, May 2001, 349-362.

Cervellati, Matteo, and Uwe Sunde. *Human Capital Formation, Life Expectancy and the Process of Economic Development*. IZA Discussion Paper No. 585, September 2002.

Case, Ann. "Health, Income, and Economic Development." In Boris Pleskovic and Nicholas Stern, eds., *Annual World Bank Conference on Development Economics 2001/2002*, New York: Oxford University Press, 2002.

Dercon, Stefan, and Pramila Krishnan. "In Sickness and in Health: Risk Sharing within Households in Rural Ethiopia." *Journal of Political Economy* 108, August 2000, 688-727.

Ersado Lire, Gregori Amacher, and Jeffrey Alwang. *Productivity and Land Enhancing Technologies in Northern Ethiopia: Health, Public Investments, and Sequential Adoption*. Environment and Production Technology Division Discussion Paper No. 102, International Food Policy Research Institute, April 2003.

Fafchamps, Marcel, and Agnes Quisumbing. *Marriage and Assortative Matching in Rural Ethiopia*. Paper Presented at the North-East Universities Development Consortium Conference, New Haven, CT, October 2003.

Ferro-Luzzi, A., C. Scaccini, S. Taffese, B. Abera, and T. Demeke. "Seasonal Energy Deficiency in Ethiopian Rural Women." *European Journal of Clinical Nutrition* 44, 1990, 7-18.

Gawn, Glynis, Robert Innes, Gordon Rauser, and David Zilberman. "Nutrient Demand and the Allocation of Time: Evidence from Guam." *Applied Economics* 25, June 1993, 811-830.

Ghosh, Suman, and Ravi Kanbur. *Male Wage and Female Welfare: Private Markets, Public Goods, and Intrahousehold Inequality*. Paper Presented at the North-East Universities Development Consortium Conference, New Haven, CT, October 2003.

Haddad, Lawrence, Christine Pena, Chizuru Nishida, Agnes R. Quisumbing, and Alison Slack. *Food Security and Nutrition Implications of Intrahousehold Bias: a Review of Literature*. Food Consumption and Nutrition Division Discussion Paper No. 19, International Food Policy Research Institute, September 1996.

Kevane, Michael. *Women and Development in Africa: How Gender Works*. Boulder, CO: Lynne Rienner, 2004.

Kimhi, Ayal. "Socio-Economic Determinants of Health and Physical Fitness in Southern Ethiopia." *Economics and Human Biology* 1, January 2003, 55-75.

Kimhi, Ayal, and Nathan Sosner. *Intrahousehold Allocation of Food in Southern Ethiopia*. Working Paper No. 20002, The Center for Agricultural Economic Research, February 2000.

National Research Council. *Recommended Dietary Allowances*, 10th Edition. Washington, DC: National Academy Press, November 1989.

Pijls, Loek T.J., Arnold A.M. Timmer, Zewdie Wolde-Gebriel, and Clive E. West. "Cultivation, Preparation and Consumption of Ensete (Ensete Ventricosum) in Ethiopia." *Journal of the Science of Food and Agriculture* 67, January 1995, 1-11.

Quisumbing, Agnes R., and John A. Maluccio. *Intrahousehold Allocation and Gender Relations: New Empirical Evidence from Four Developing Countries*. Food

Consumption and Nutrition Division Discussion Paper No. 84, International Food Policy Research Institute, April 2000.

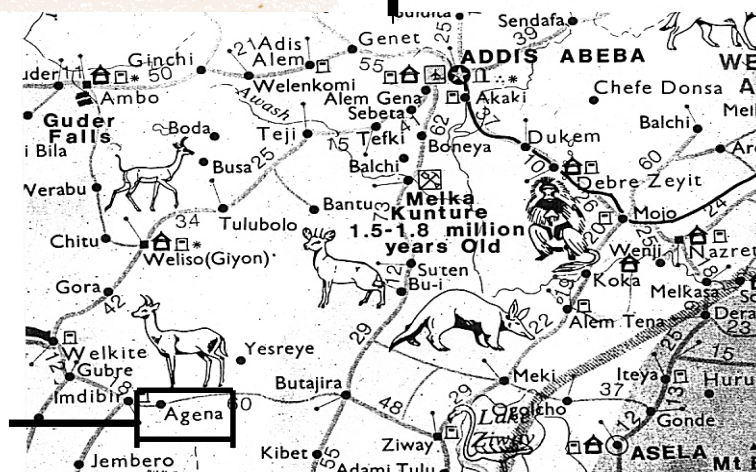
Schultz, T. Paul. "Assessing the Productive Benefits of Nutrition and Health: An Integrated Human Capital Approach." *Journal of Econometrics* 77, March 1997, 141-158.

Senauer, Benjamin, Marito Garcia, and Elizabeth Jacinto. "Determinants of the Intrahousehold Allocation of Food in the Rural Philippines." *American Journal of Agricultural Economics* 70, February 1988, 170-180.

Shetty, P.S., and W.P.T James. *Body Mass Index: A Measure of Chronic Energy Deficiency in Adults*. FAO Food and Nutrition Paper 56, 1994.

Strauss, John, and Duncan Thomas. "Health, Nutrition, and Economic Development." *Journal of Economic Literature* 36, June 1998, pp. 766-817.

de Vasconellos, M.T.L. "Body Mass Index: Its Relationship with Food Consumption and Socioeconomic Variables in Brazil." *European Journal of Clonical Nutrition* 48, November 1994, S115-S123.



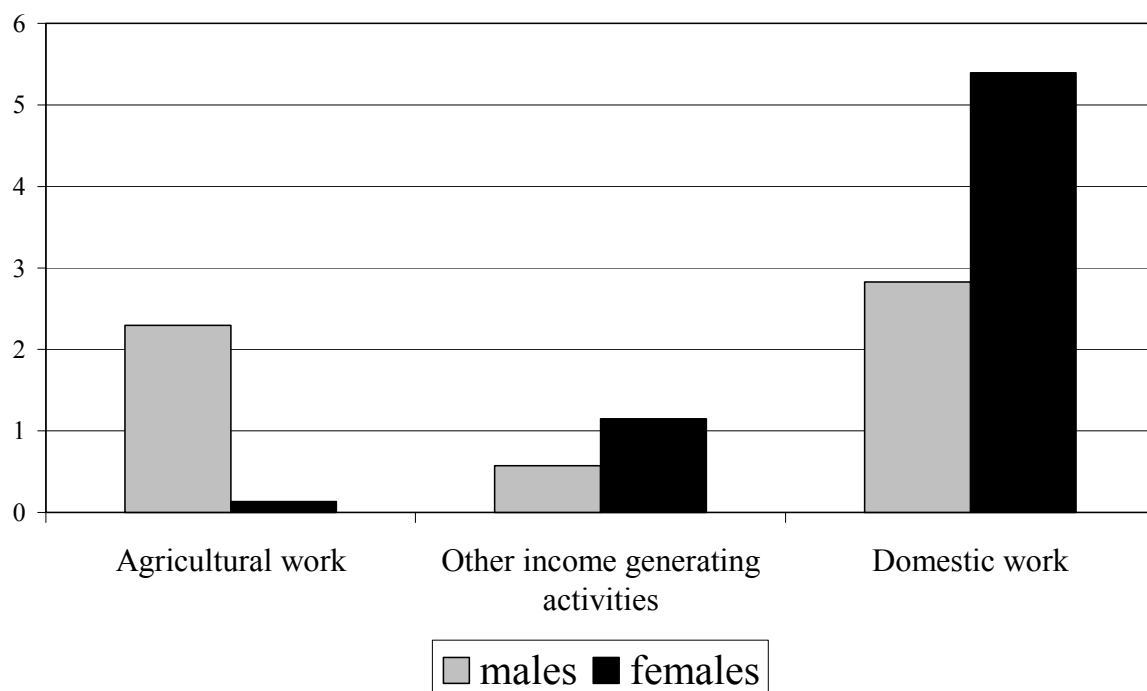


Figure 2. Time Allocation in the Day Prior to the Survey

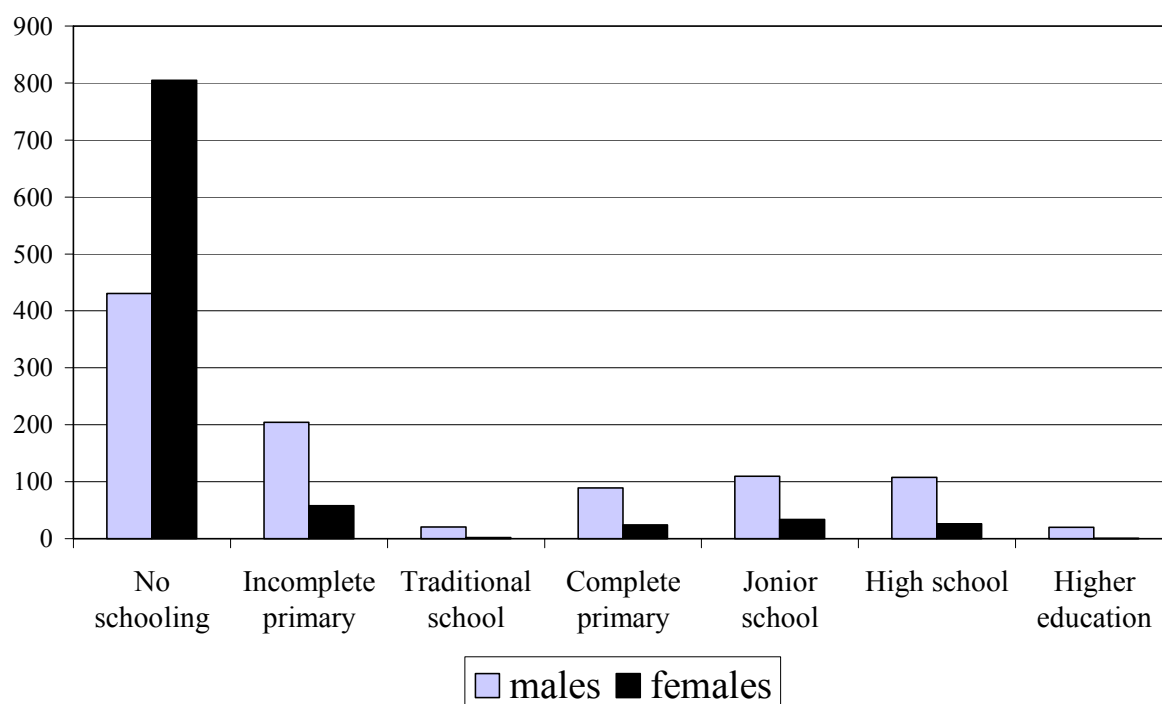


Figure 3. Gender Differences in Schooling

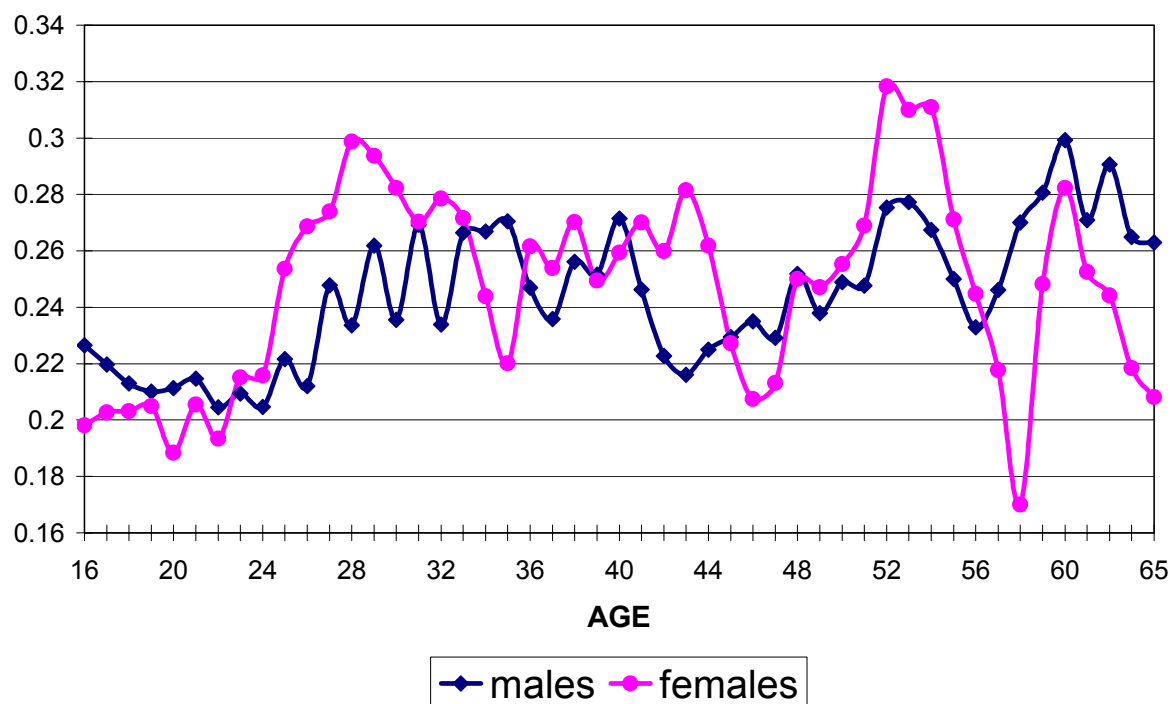


Figure 4. Average Calorie Shares within Household by Age and Gender

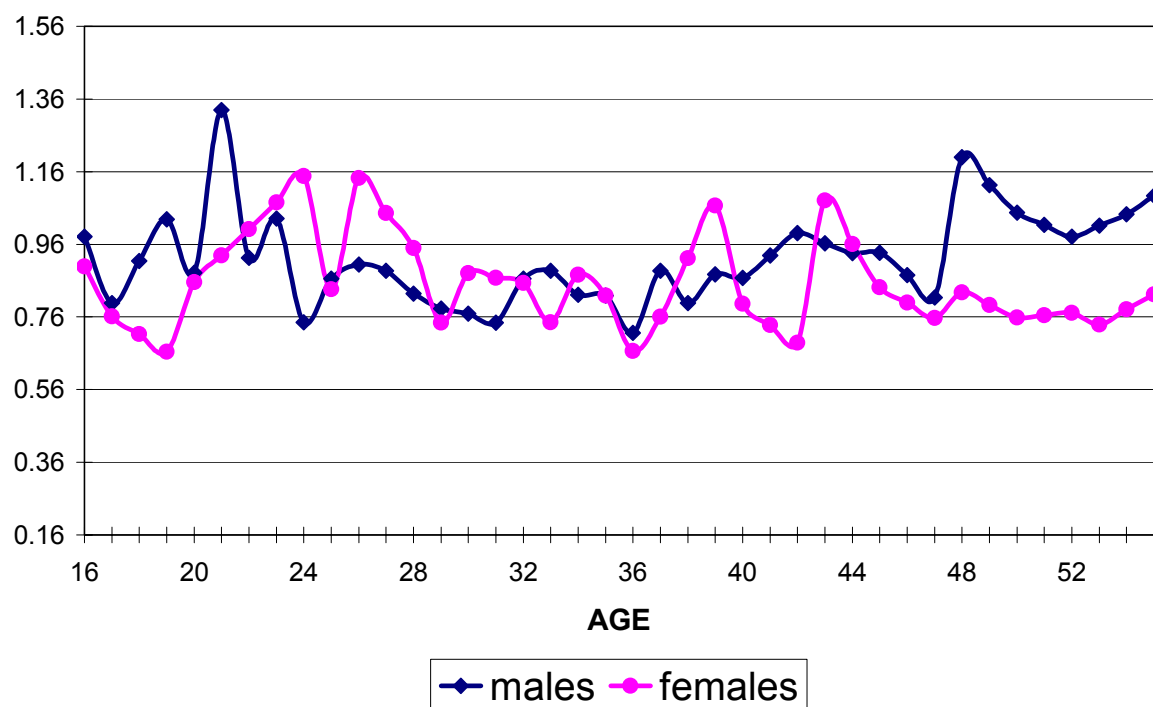


Figure 5. Average Relative NAR by Age and Gender

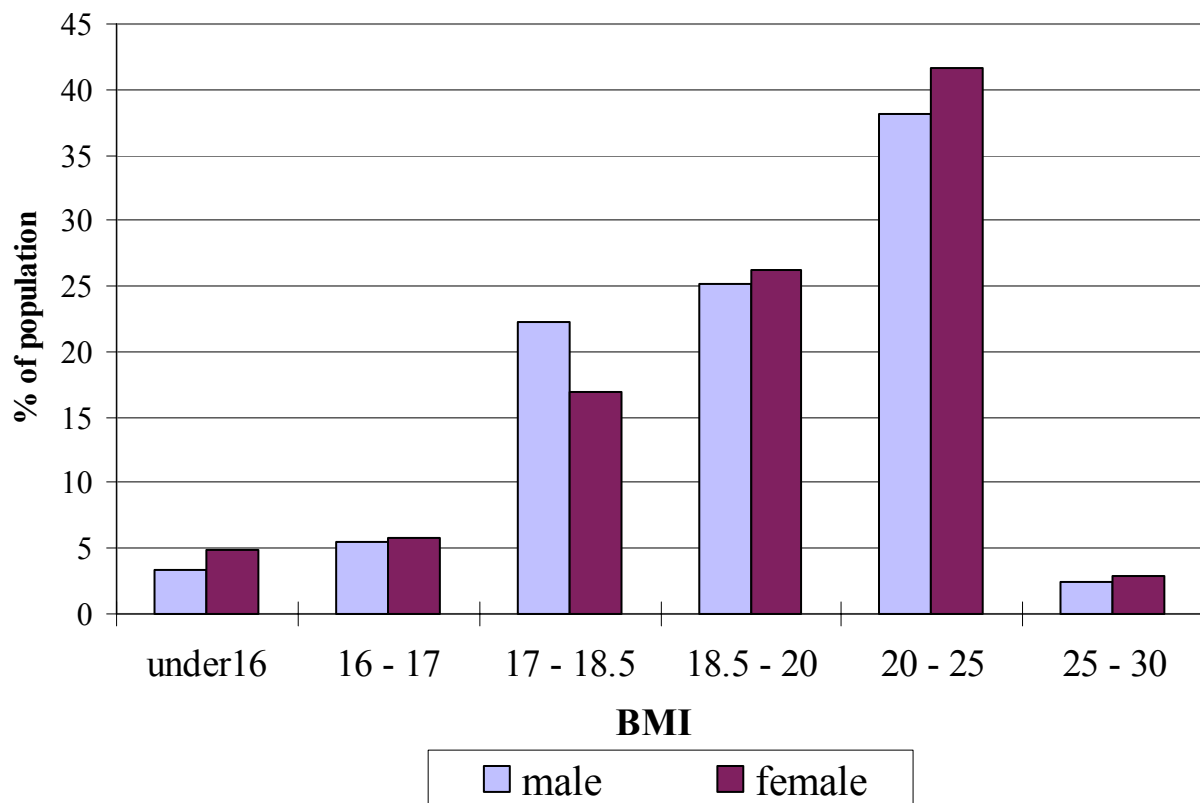


Figure 6. Histograms of BMI

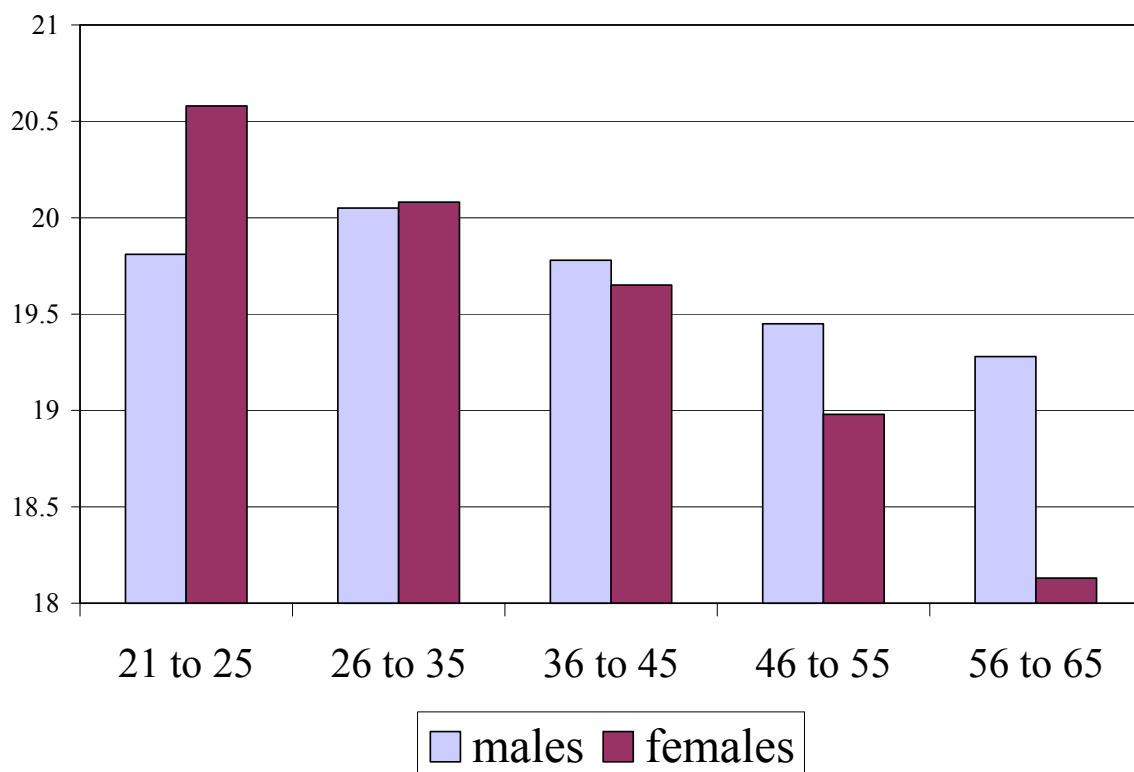
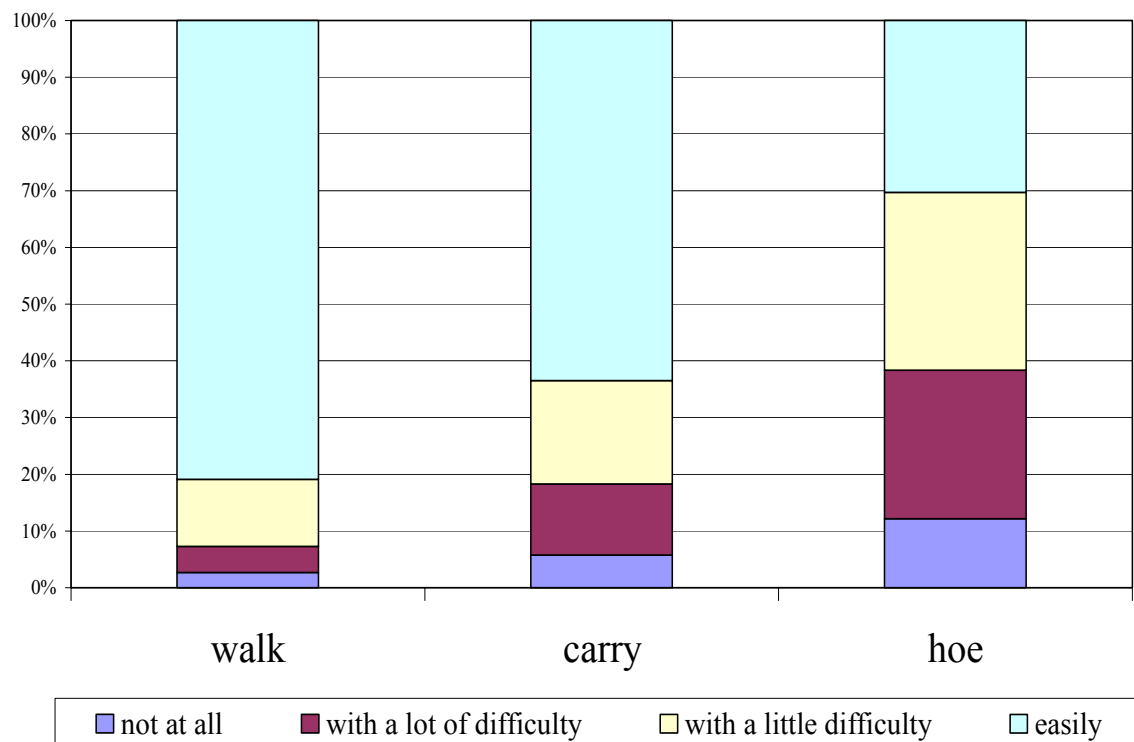


Figure 7. Age Profiles of BMI

(A) Females



(B) Males

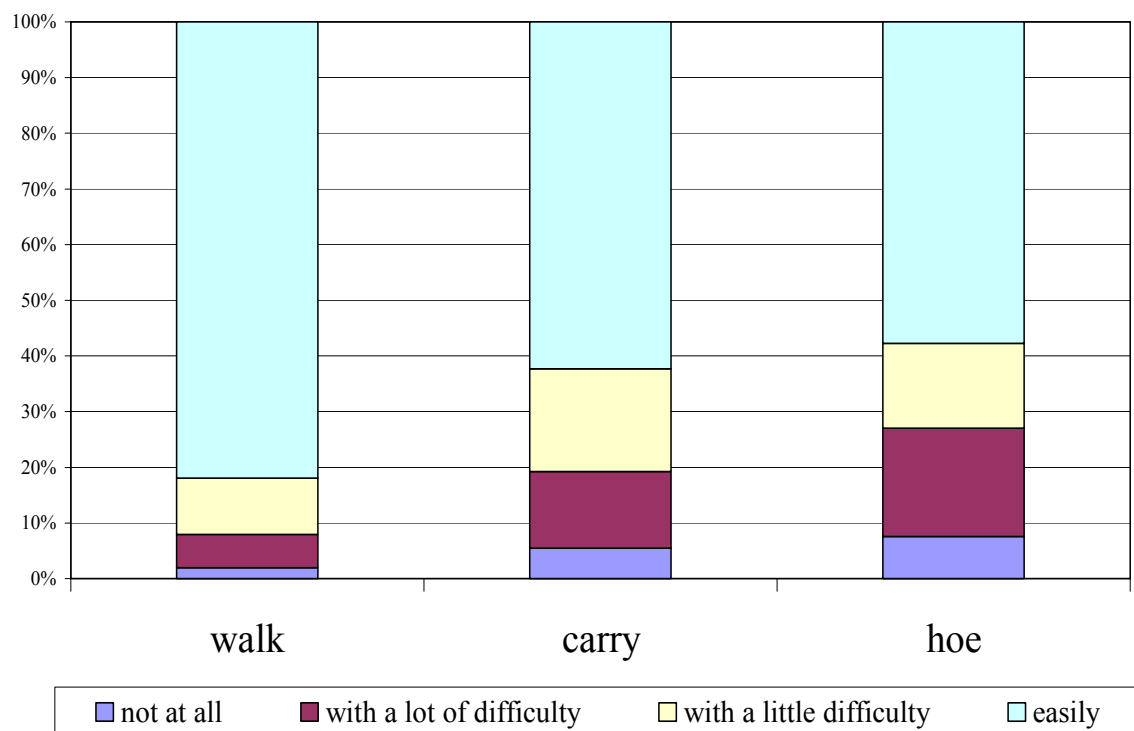


Figure 8. Difficulties in Performing ADL

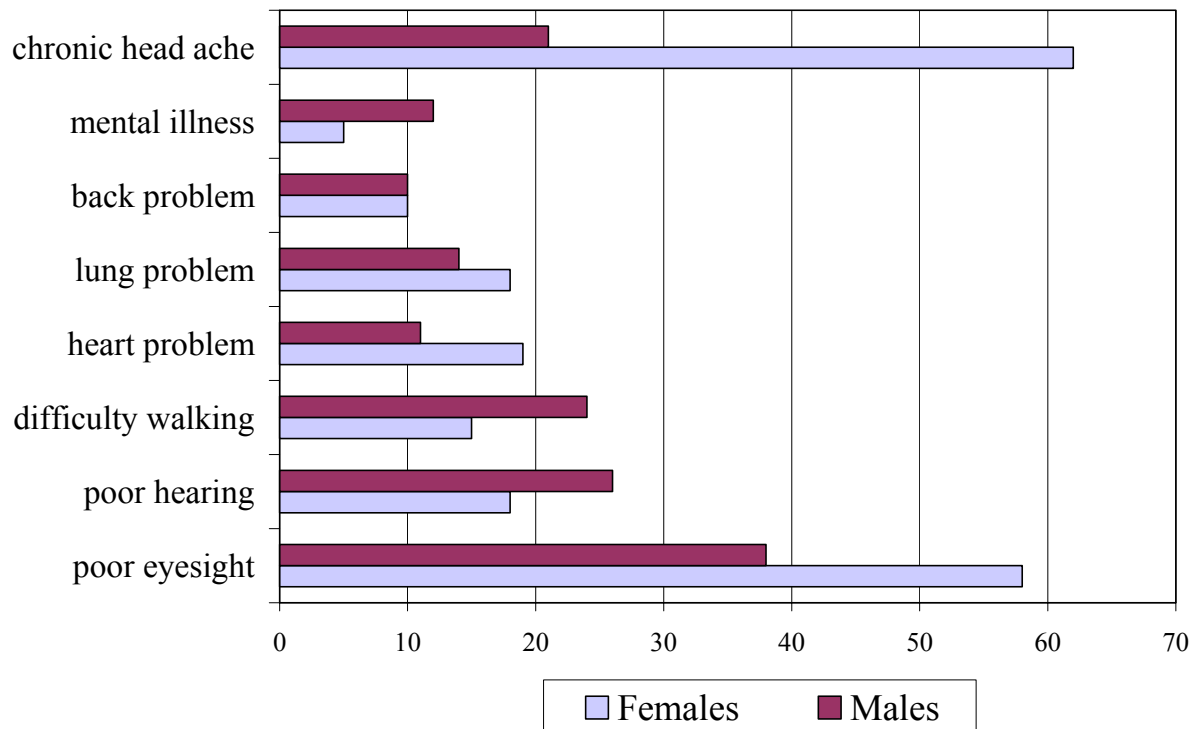


Figure 9. Types of Disabilities

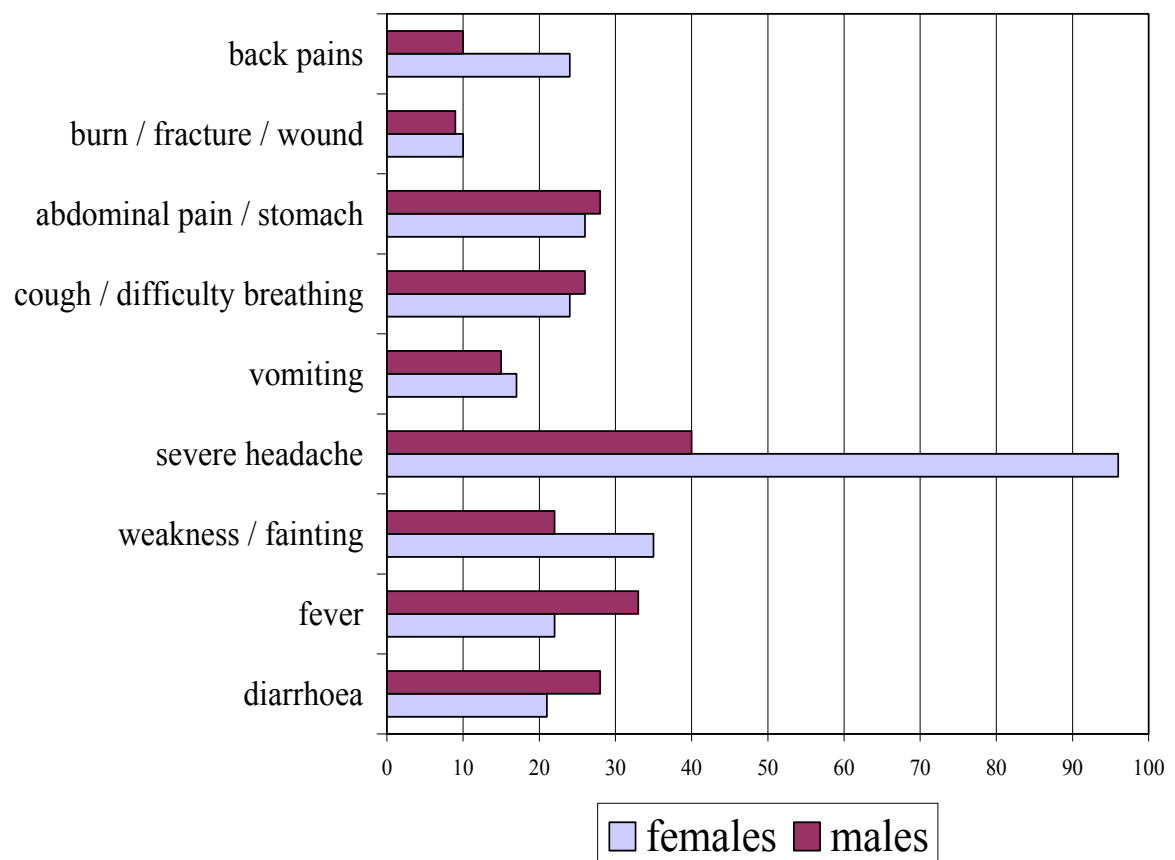


Figure 10. Illness Symptoms

PREVIOUS DISCUSSION PAPERS

- 1.01 Yoav Kislev - Water Markets (Hebrew).
- 2.01 Or Goldfarb and Yoav Kislev - Incorporating Uncertainty in Water Management (Hebrew).
- 3.01 Zvi Lerman, Yoav Kislev, Alon Kriss and David Biton - Agricultural Output and Productivity in the Former Soviet Republics.
- 4.01 Jonathan Lipow & Yakir Plessner - The Identification of Enemy Intentions through Observation of Long Lead-Time Military Preparations.
- 5.01 Csaba Csaki & Zvi Lerman - Land Reform and Farm Restructuring in Moldova: A Real Breakthrough?
- 6.01 Zvi Lerman - Perspectives on Future Research in Central and Eastern European Transition Agriculture.
- 7.01 Zvi Lerman - A Decade of Land Reform and Farm Restructuring: What Russia Can Learn from the World Experience.
- 8.01 Zvi Lerman - Institutions and Technologies for Subsistence Agriculture: How to Increase Commercialization.
- 9.01 Yoav Kislev & Evgeniya Vaksin - The Water Economy of Israel--An Illustrated Review. (Hebrew).
- 10.01 Csaba Csaki & Zvi Lerman - Land and Farm Structure in Poland.
- 11.01 Yoav Kislev - The Water Economy of Israel.
- 12.01 Or Goldfarb and Yoav Kislev - Water Management in Israel: Rules vs. Discretion.
- 1.02 Or Goldfarb and Yoav Kislev - A Sustainable Salt Regime in the Coastal Aquifer (Hebrew).
- 2.02 Aliza Fleischer and Yacov Tsur - Measuring the Recreational Value of Open Spaces.
- 3.02 Yair Mundlak, Donald F. Larson and Rita Butzer - Determinants of Agricultural Growth in Thailand, Indonesia and The Philippines.
- 4.02 Yacov Tsur and Amos Zemel - Growth, Scarcity and R&D.
- 5.02 Ayal Kimhi - Socio-Economic Determinants of Health and Physical Fitness in Southern Ethiopia.
- 6.02 Yoav Kislev - Urban Water in Israel.
- 7.02 Yoav Kislev - A Lecture: Prices of Water in the Time of Desalination. (Hebrew).

- 8.02 Yacov Tsur and Amos Zemel - On Knowledge-Based Economic Growth.
- 9.02 Yacov Tsur and Amos Zemel - Endangered aquifers: Groundwater management under threats of catastrophic events.
- 10.02 Uri Shani, Yacov Tsur and Amos Zemel - Optimal Dynamic Irrigation Schemes.
- 1.03 Yoav Kislev - The Reform in the Prices of Water for Agriculture (Hebrew).
- 2.03 Yair Mundlak - Economic growth: Lessons from two centuries of American Agriculture.
- 3.03 Yoav Kislev - Sub-Optimal Allocation of Fresh Water. (Hebrew).
- 4.03 Dirk J. Bezemer & Zvi Lerman - Rural Livelihoods in Armenia.
- 5.03 Catherine Benjamin and Ayal Kimhi - Farm Work, Off-Farm Work, and Hired Farm Labor: Estimating a Discrete-Choice Model of French Farm Couples' Labor Decisions.
- 6.03 Eli Feinerman, Israel Finkelshtain and Iddo Kan - On a Political Solution to the Nimby Conflict.
- 7.03 Arthur Fishman and Avi Simhon - Can Income Equality Increase Competitiveness?
- 8.03 Zvika Neeman, Daniele Paserman and Avi Simhon - Corruption and Openness.
- 9.03 Eric D. Gould, Omer Moav and Avi Simhon - The Mystery of Monogamy.
- 10.03 Ayal Kimhi - Plot Size and Maize Productivity in Zambia: The Inverse Relationship Re-examined.
- 11.03 Zvi Lerman and Ivan Stanchin - New Contract Arrangements in Turkmen Agriculture: Impacts on Productivity and Rural Incomes.
- 12.03 Yoav Kislev and Evgeniya Vaksin - Statistical Atlas of Agriculture in Israel - 2003-Update (Hebrew).
- 1.04 Sanjaya DeSilva, Robert E. Evenson, Ayal Kimhi - Labor Supervision and Transaction Costs: Evidence from Bicol Rice Farms.
- 2.04 Ayal Kimhi - Economic Well-Being in Rural Communities in Israel.
- 3.04 Ayal Kimhi - The Role of Agriculture in Rural Well-Being in Israel.
- 4.04 Ayal Kimhi - Gender Differences in Health and Nutrition in Southern Ethiopia.