

## THE HEALTH OF ADULT WOMEN IN ACCRA, GHANA: SELF-REPORTING AND OBJECTIVE ASSESSMENTS 2008-2009

R. DARKO<sup>1</sup>, R. M. ADANU<sup>2</sup>, R. B. DUDA<sup>3</sup>, N. DOUPTCHEVA<sup>4</sup> and A. G. HILL<sup>4</sup>

<sup>1</sup>Department of Surgery, University of Ghana Medical School, Accra, Ghana; <sup>2</sup>Department of Obstetrics and Gynaecology, University of Ghana Medical School, Accra, Ghana; <sup>3</sup>Department of Surgery, Beth Israel Deaconess Hospital, Harvard Medical School, Boston, MA, USA; <sup>4</sup>Center for Population & Development Studies, Harvard School of Public Health, Boston, MA, USA

*Author for Correspondence: Professor Rudolph Darko*  
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*E-mail: rdarko@ug.edu.gh*

### SUMMARY

**Objectives:** The study provides a full description of the state of women's health in Accra, Ghana using self-reported as well as objective health measures. Using data from the Women's Health Survey of Accra, Wave 2 (WHS-A-2), the authors a) examine the consistency of the objective measures of health status (anthropometry and blood pressures) with self-report measures, including the Short Form 36 indices for 8 separate domains of health; and b) describe the main socio-economic differentials in morbidity.

**Methods:** Cross-sectional household survey with field measurements. 2814 women aged 18 and over were interviewed and measured in their homes in late 2008 and early 2009. The physical measurements included height, weight, waist and hip measurement and 3 or more measures of resting blood pressure.

**Results:** Using the 8 domains of self-reported health captured by the Short Form 36 instrument, we find that physical health worsens more sharply with age than mental health. Social class differentials are narrow in the younger cohorts but widen amongst the elderly. The physical measurements reveal unhealthy levels of obesity and hypertension, worsening steadily with rising age. Age and the wealth of the household influence women's health more than their individual characteristics such as education.

**Conclusions:** Younger women appear to be in good health with steady declines in physical and mental health with age. The major threat to women's health appears to be the rising levels of obesity and hypertension with mean BMIs for all women over age 45 in excess of 30, producing elevated blood pressures and associated high risks of heart attacks and stroke rising sharply amongst the elderly.

**Keywords:** Women's health, obesity, hypertension, self-reported health, Ghana

### INTRODUCTION

Comparative community-based measures of health or morbidity were uncommon in African populations until the advent of the WHO-sponsored World Health Surveys in the early 2000s. The reasons for this are complex but include the higher priority attached to premature mortality and in part due to uncertainty about the reliability of self-reported health measures as well as their relationship to more medical or 'objective' measures of health. There is a growing realization of the importance of population-based measures of health based on representative samples rather than just that fraction seeking care in the public and private health facilities. As mortality amongst both children and adults improves everywhere, there is an increased need for reliable information on the burden of illness or years lost due to disability to guide preventive measures and interventions in addition to the more commonly available measures of years of life lost due to premature mortality.

That said, there are several theoretical and practical challenges to the systematic collection of morbidity information for large populations. Although most accept the broad 1948 WHO definition of good health as 'A state of complete physical, mental and social well-being, and not merely the absence of disease', the definition itself raises major questions of measurement by referring to 'well-being' as the desirable outcome. This term has many interpretations and clearly requires the clinical manifestations of illness to be placed in a broader social and economic context. So for the person setting out to measure population health, the challenge is thus deciding on what to collect – the physical and mental symptoms of illness; the associated disability or the degree to which individuals are handicapped due to the illness; possibly adding the physical or attitudinal constraints or the ameliorating impacts of service provision and broader care. The International Classification of Impairments, Disabilities and Handicaps (ICIDH, 1980) recognizes impairment as a loss of structure or abnormality of function at the organ level; disability as a restriction of actions at the person level; and handicap

as a set of disadvantages within the individual's particular social context. Thus, three different levels are involved with, in most cases, impairment leading to disability and disability leading to handicap. Collecting field data on all three levels requires different approaches, often with different degrees of objectivity and very different measurement scales. An important point to retain is the distinction between clinical assessments at the individual level such as those conducted by clinicians on individual patients (see the many clinical scales provided in texts such as McDowell and Newell 1996) and measures of population health in which distributions and differentials assume greater importance than absolute measures of health as originally advocated by Rose 1992.<sup>1,2</sup> Rose's core message was the importance of prevention rather than cure alone, hence his emphasis on risk factors and the notion of risk distributed to different degrees across the whole population rather than simply concentrated at the extremes – the seriously ill.

### **The aims and content of the Women's Health Study of Accra (WHSa-II)**

In 2003, a team of researchers from the Institute of Statistical, Social and Economic Research (ISSER), University of Ghana, and Harvard University conducted detailed health and household interviews amongst a representative sample of just under 3200 women aged 18 and over – the Women's Health Study of Accra, Wave I (WHSa-I). Summary findings of this study have been published elsewhere.<sup>3</sup> The original sample was stratified by the socio-economic status of their Enumeration Area (EA) of residence, and older women were over-sampled in order to assure sufficient statistical power for the analysis of health patterns among this relatively under-researched age group. Just over 1300 of the women interviewed were given full medical examinations at Korle-Bu Teaching Hospital, which included measurement of blood pressure, height, weight, cholesterol level and tests for diabetes and HIV status. Results are summarized in a series of papers and a final report referenced in the bibliography. The Ghana arm of the 2003 World Health Survey by contrast only interviewed respondents on their state of health (full details of this study found at :

<http://www.who.int/healthinfo/survey/whsga-ghana.pdf>) but the WHSa-I went a step further to include medical examinations and blood tests.<sup>3</sup>

The follow-up study – Women's Health Study, Wave II (WHSa-II) conducted in 2008-9 – built on the detailed survey work from Wave I and was designed to obtain new empirical information on the links between health and wealth at the household level. Both waves were intended to expand our understanding of the impact of health on poverty and development by focusing on the longitudinal observations at the household rather than

the individual level. The studies have produced a great deal of new empirical information on the epidemiology and demography of health and mortality in adults and children in a major African city.

The primary objective of the second wave of the study was to quantify the burden of disease and changes since Wave I in 2003 based on the prevalence of communicable and non-communicable disease in a representative sample of Ghanaian women aged 18 years and older normally resident in the Accra Metropolitan Area (AMA). Linked with this general goal was the interest in identifying risk factors and exposure variables for the salient conditions identified in Wave I of the study.

The specific objectives of Wave II thus included:

- Collection of self-reported data on general health and specific health domains using the Medical Outcomes Study Short Form – 36 (SF-36) for comparison with Wave I results for the same questions;<sup>4</sup>
- Provision of the first description of morbidity and its socio-economic consequences amongst the elderly in an African city;
- Estimation of the prevalence of disease from a comprehensive medical history with some physical tests and a combination of recorded disease-specific symptoms, reported encounters with the health services and family medical histories;
- Examination of the impact of the newly introduced national health insurance scheme on health care seeking.

Here we report primarily on the findings from the first two aims listed above.

## **METHODS**

In the first wave of this study conducted in 2003, in addition to identifying the continuing importance of infectious disease (mainly malaria-like fevers), the study drew attention to the remarkably high levels of hypertension, hypercholesterolemia and diabetes linked to obesity.<sup>4</sup> These conditions were ascertained using a combination of self-reported illness and risk factors obtained through household interviews and clinical examinations with accompanying biological tests. The first wave of the survey demonstrated the consistency of the self-reports but also the difficulty of interpreting the symptom complexes reported. The small differentials in reported and measured health by the usual socio-economic attributes (education, household wealth, income and neighbourhood characteristics) were a surprise, recurring in the Wave II study. Another set of salient conditions was the mental health disorders.<sup>5</sup>

A practical constraint in Wave I was the willingness of women to participate in the medical component which involved a very early morning attendance (to capture fasting blood sugars) at the out-patient clinic of the Department of Obstetrics and Gynaecology at Korle Bu Hospital and the organizational challenges of providing appropriate numbers examining physicians given the unreliability of the booking procedures. In Wave II, therefore, it was decided to concentrate on collecting as much data during the household interview, with the administration of the standard tests (anthropometry, blood pressure and vision tests) in the home.

The final version of the WHSA-II household questionnaire consisted of 25 sections in addition to a household roster and details of the dwelling's characteristics. The sections were women's characteristics and migration, general health, self-care, pain and discomfort, community role, energy and sleep, mental health, routine health maintenance, use of health services, health insurance, malaria, heart-blood-vessels-lungs, specific health conditions and symptoms, medication history, family history, reproductive health and family planning, pregnancy

history, pregnancy and malaria, breastfeeding, smoking and drinking, physical activity, nutrition, changes made to improve health, body image assessment and medical measurements. The sections were chosen to address major health issues identified in Wave-I (hypertension, obesity, 'malaria', depression and mental illness) as well as new topics of interest to policy makers and programs (participation in the national and district mutual health insurance schemes, malaria protection and treatment and the use of induced abortion). The survey instruments are available in full in the Final Report on the study published by ISSER, University of Ghana.<sup>6</sup>

## RESULTS

### The study population

Since the initial sample selection included women 18+, at the second wave, those same women had all aged by 5-6 years in the intervening period. The original survey over-sampled the older women to provide roughly equal numbers of women in the 4 age groups shown in Table 1.

**Table 1** WHSA-II sample distribution by socio-economic group and age group

Socio-economic status of EA	Age group				
	18-24	25-34	35-54	55+	All
Low class	211	187	180	207	785
Low middle class	202	127	178	134	641
Upper middle class	197	153	185	182	717
High class	174	148	174	175	671
	784	615	717	698	2814

Close to half of the women in the study (48.9%) and in all sub-Metros were living with a man, while the percentage of those currently married was very small. The majority of women in the study had lived in an urban setting during their childhood until 12 years of age. In addition, more than half of the respondents (58.7%) were born in the Greater Accra region, while the second largest group were native to the Eastern Region (13.5%). The distribution of educational attainment in the study revealed that 78.6% of respondents had some kind of education, while 21.2% had no education. The majority of the respondents in the survey were Christian (82.8%) and 12.6% were Muslim. The largest ethnic group represented in the survey was the Ga (40.5%), closely followed by the Akan (32.5%). The distribution of the primary language of the respondents corresponded closely with the ethnic distribution within the sample, with Ga being the overall most predominant language (45.5%), followed by Twi/Fante (32.6%).

The predominant work status was self-employed, accounting for 51.5% because of the large number of jobs in the informal sector – street vendors, food preparers and sellers, seamstresses and handywomen.

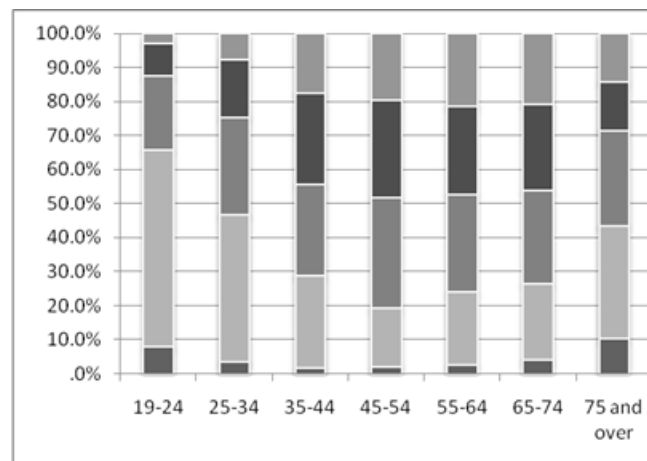
### Objective measures of health

The anthropometric data provide a useful summary of the general health of the population. Table 2 shows the mean heights, weights and waist and hip measurements for the study women. In general, the women are quite short (157 cm on average) but are relatively heavy (mean weight of 71.4 kg). Note that height in the younger cohorts has been increasing steadily, suggestive of improved nutrition and protein intake in particular amongst the younger women. Both for the body mass index (BMI) and the waist/hip ratio, however, we find that with the exception of the first age group, all the average measures are beyond the ideal threshold for good health.

**Table 2** The physical characteristics of the female population

Age groups	Height cm	Weight kg	Waist cm	Hip cm	BMI	Waist/hip ratio
19-24	159.6	62.8	80.7	98.0	24.3	0.82
25-34	160.4	68.3	86.3	102.7	26.5	0.84
35-44	160.9	76.4	95.1	107.6	29.5	0.88
45-54	158.9	77.8	97.1	109.0	30.4	0.89
55-64	157.0	75.5	98.0	106.9	30.2	0.92
65-74	151.0	70.7	95.9	103.5	29.6	0.93
75 and over	135.6	57.4	83.4	90.7	26.9	0.92
Total	157.0	71.4	91.7	104.1	28.4	0.88

Not all the women are over-weight but for women aged 35-74, overall 47% were obese or clinically obese (BMIs 30 and above). Figure 1 shows this progression towards obesity with age; the last age group has lower levels of obesity mainly because of the selective effects of mortality but there may also be some loss of body mass as women age as seen in other elderly populations. Use of the BMI has been criticised as a measure of obesity because of the importance of height but other measures of obesity in this population (e.g. waist-hip measures) also display the same trend (Table 2).

**Figure 1** The distribution of BMI levels by age group

### Hypertension

Systolic and diastolic blood pressure was measured three or four times at the beginning, middle or end of each interview. After discarding clearly erroneous readings, the average systolic blood pressure readings are shown in Table 3. The effect of age is obvious but even for younger women, substantial proportions had high readings.

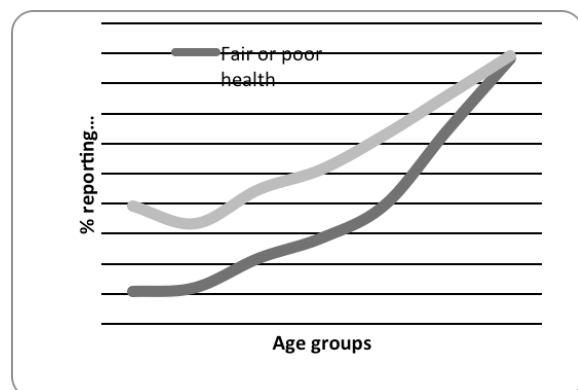
**Table 3** Mean systolic blood pressures measured at home

Age groups	Systolic BP mmHg (average of 3 or more measures)				
		<= 120.00	120.01 - 140.00	140.01 and over	Total
19-24	N	119	43	4	166
	%	72%	26%	2%	100%
25-34	N	520	253	39	812
	%	64%	31%	5%	100%
35-44	N	225	223	102	550
	%	41%	40.55%	18.55%	100%
45-54	N	94	136	133	363
	%	26%	37%	37%	100%
55-64	N	71	127	193	391
	%	18%	32%	49%	100%
65-74	N	44	102	185	331
	%	13%	31%	56%	100%
75 and over	N	28	51	105	184
	%	16%	28%	57%	100%
Total	N	1101	935	761	2797
	%	39%	33%	27%	100%

### Self-reported health

There are many approaches to measuring health status in a population through interview, ranging from the very simple format used in the UK census of 2011 ('How is your health in general?') to extensive interviews taking more than an hour to complete (e.g. WHO's World Health Survey). In the Women's Health Study Wave II, given that all interviews were to be completed at home and without a clinical component, we chose an intermediate path including some simple questions widely used in health surveys around the world as well as a well-tested standardized set of questions leading to the construction of hybrid scales in eight health domains. The importance of distinguishing between health indicators used to assess the health status of populations and those to measure health state changes in individual patients has been underlined.<sup>1</sup>

In response to the straightforward questions, 'In general, would you say your health is ... excellent/very good/good, fair, poor?' and the commonly used health transition question ('Compared to one year ago, how would you rate your health in general now ... much better/somewhat better/about the same/somewhat worse/much worse?'), we find the following results (Figure 2).



**Figure 2** Proportion of women reporting fair to poor health and a worsening of their health state compared to a year ago

The women seemingly perceived that their health was getting worse from about age 30 onwards with a steady worsening to about 45% of the total for the oldest women. The proportions of those in fair or poor health also rose with age from about age 30 onwards but at a steeper rate, especially beyond age 60.

These proportions are much as expected but the surprising feature is that the majority of women, even at the higher ages, perceive their health as good or better and either not changing or improving over the year before the interviews.

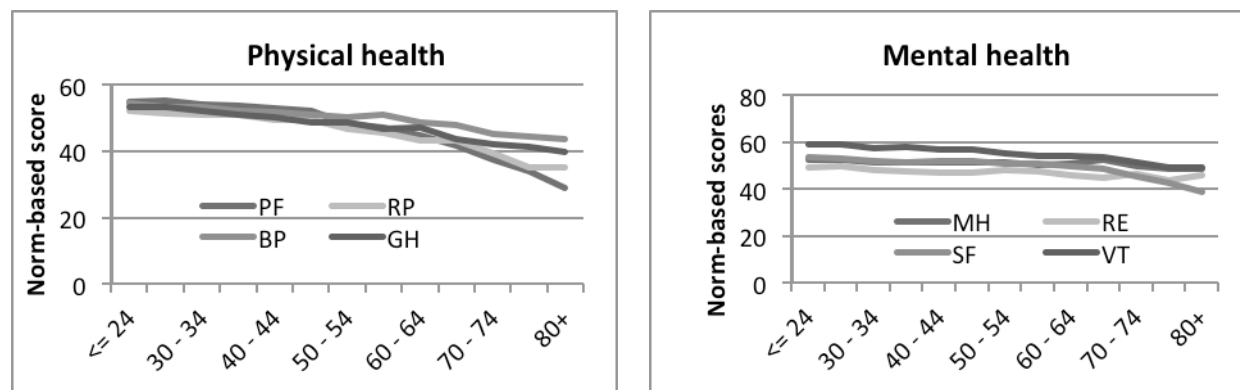
Regarding differentials, we observe small differences by educational achievement in the self-reported health question but there is a gradient with the better educated reporting better health overall. For the health transition question, the differentials are quite narrow with the exception of the best educated (beyond secondary education) whose health as not worsening as fast as the others. By area of residence, the current health status of those living in poor neighbourhoods is worse than for other areas of the city but in terms of their health transition, only those women living in the richer neighbourhoods report a slower worsening of their health. In short, place of residence only seems to matter at the extremes (Table 4).

**Table 4** Percentages of women by age reporting fair or poor health or a worsening of their health over the last year by social class of their Enumeration Area of residence

Age	Fair or poor health				Worse or much worse compared to last year			
	Lower class	Lower middle class	Upper middle class	Upper class	Lower class	Lower middle class	Upper middle class	Upper class
19-24	5.6%	2.2%	8.8%	5.9%	18.5%	21.7%	26.5%	11.8%
25-34	7.3%	7.4%	8.3%	1.1%	20.7%	18.4%	16.6%	10.5%
35-44	18.1%	9.6%	8.7%	6.5%	20.6%	33.9%	23.0%	13.8%
45-54	23.3%	16.0%	10.5%	8.2%	32.6%	29.6%	23.8%	17.6%
55-64	31.6%	18.8%	16.5%	12.6%	29.9%	40.5%	32.5%	24.2%
65-74	45.8%	28.8%	22.5%	29.1%	39.6%	37.0%	32.5%	43.0%
75 and over	46.3%	40.5%	51.1%	38.5%	37.0%	40.5%	42.6%	57.7%
Total	21.7%	14.5%	14.5%	11.3%	26.5%	29.4%	25.3%	21.7%
Total women	785	641	717	670	785	641	717	670

More sophisticated instruments employ several items (questions) to construct standardized scales. These scales can be used in different ways, including analyzing the raw scores or by standardization against some external norms to allow comparison within and between populations. In the WHSA-I and II, we included the Short Form 36 (SF-36) questions developed initially for the RAND Medical Outcomes Study and adopted by Ware *et al.*<sup>4,7</sup> There are minor differences in the scaling of each but here we chose to adopt the RAND system of scaling detailed by Hays *et al.* The SF-36 measures eight health domains including physical functioning (PF), bodily pain (BP), role limitations due to

physical health problems (RP), role limitations due to personal or emotional problems (RE), general mental health (MH), social functioning (RE), energy/fatigue (VT), and general health perceptions (GH). In the figures, the score of 50 represents the average for each age group in the reference population and the scale runs from 0 (very bad) to 100 (very good). Some of the summary titles for the health domains are misleading (e.g. MH comprising 5 items including being *nervous, down in the dumps, peaceful, downhearted/depressed, happy* does not fully capture the concept of mental health) but the summary labels are used here to facilitate comparison with other studies.



**Figure 3** Women’s norm-based scores on 4 physical health (left) and 4 mental health domains (right) by age using the means and SDs from US women for standardization

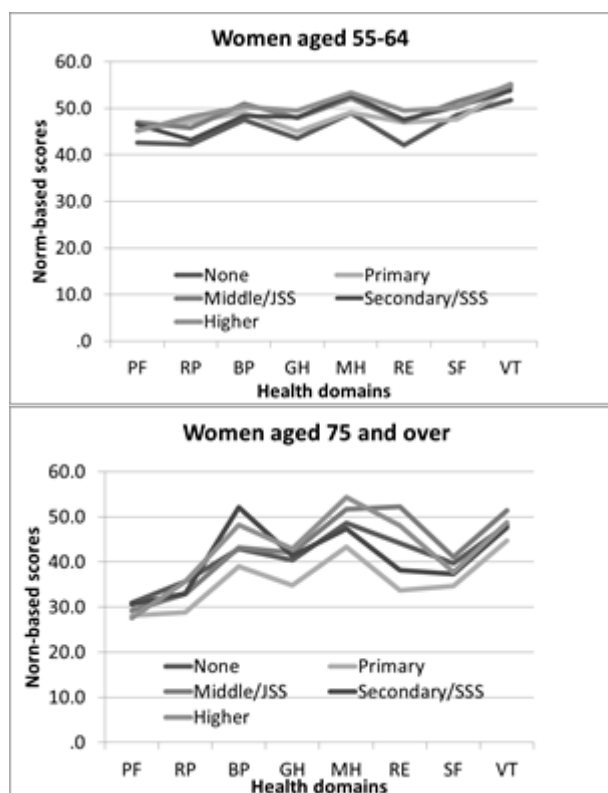
In Figure 3 (left), we see the clear relationship between age and physical health with pronounced declines in all 4 physical domains of health by age. Younger women in Accra thus report very similar levels of physical health to their US counterparts but all the health states decline sharply after age 55 with bodily pain showing the slowest decline. In Figure 3 (right), we see the corresponding scores for the so-called mental health domains with much slower declines in reported health status by age. The social functioning index (capturing the engagement in social activities and time devoted to such activities) falls off more steeply than for other measures. In contrast to the measures of physical health, overall the score for the four domains in the Accra women are very similar to the US standard.

Across most age groups and domains, we observe only small differentials in health status by education although amongst the older women (75 and over), it seems those with primary education are in poorer health than those with no schooling. The gaps are wider for the 4 ‘mental health’ domains, perhaps because these measures include more features of the social background and resources than the simpler measures of physical health.

The interpretation of these findings is not straightforward since we know that there are cultural differences in the reporting of health status but interpretable results have been obtained in widely varying communities and using languages other than English.<sup>8-12</sup> The generally good health of the Accra women is perhaps a surprise given the objective measures of physical health described above. The comparisons of the health of the elderly with other populations is confounded by mortality effects – clearly, a smaller proportion of Accra women survive to any given age than their European or North American counterparts. This means that the health state measures refer to the healthy survivors of much larger cohorts of women, the least healthy having died. The decline in health states with age would have been steeper if some of the less healthy had indeed survived to be interviewed or measured.

**Social class differentials**

Comparing the norm-based scores across a number of socio-economic variables, we note rather small differences in reported health status by key variables such as highest educational level attained (Figure 4).



**Figure 4** Norm-based scores on 8 health domains by education for two age groups of women

**Table 5.** The relationship of measured BMI to two self-reported health measures

Model	Unstandardized Coefficients		Standardized Coefficients	T	p-value
	B	Std. Error	Beta		
(Constant)	23.328	.690		33.829	.000
Age at interview	.049	.008	.127	5.810	.000
Education	-.140	.119	-.026	-1.176	.240
Wealth quintile of household	.574	.101	.119	5.690	.000
Reported own health	.133	.158	.018	.840	.401
Health transition last year	.347	.144	.047	2.411	.016

### The link between self-assessed and objectively measured health

Since we have data on both self-reported health and some objective measures, we can ask whether the two sources provide a consistent picture of levels of morbidity and of differentials by age and other socio-economic variables. Clearly, the two types of measures capture very different dimensions of health, the former picking up levels and differentials in what we might more generally call 'well-being' whereas we might assume that the objective measures pick up conditions with a stronger biological basis. The difference is often not so clear cut since some of the objective measures (obesity, high blood pressure and mild diabetes) may not have been detected or recognized prior to the interview and if asymptomatic, may not have been recognized as signs of poor health by the respondents. Taking obesity as the first measured outcome, we ask whether or not we can predict levels of the BMI from the self-reported health data. In a regression model controlling for the important confounders of age, education and the wealth of the household, we find that all the SF-36 scores on 8 domains of self-reported health only explain 20% of the variance in BMI with the Physical Function measure the only one statistically significant but with a small standardized beta coefficient (-0.128). The questions on health status and on the health transition perform better in the model than the SF-36 indicators but all are swamped by the effects of age and the wealth status of the households of the women (Table 5).

Broadly the same results are seen using blood pressure as the dependent variable. Education and age dominate with health state changes (compared with the preceding year) contribute only marginally to explaining the differences in average systolic blood.

### CONCLUSIONS

The Women's Health Study, Wave II (WHS-II) conducted in 2008-9, built on the detailed survey work from Wave I and was designed to obtain new empirical

information on the links between health and wealth at the household level. The studies have expanded our understanding of the impact of health on poverty and development by focusing on population-level health rather than information from health facilities. Health and mortality have been improving in Accra as the increasing height of the younger cohorts bears out.

Overall, the women appear to be in good health as judged from both the subjective and the objective measures. The norm-based scores, allowing comparisons with other populations (Figure 3), indicate that on all eight dimensions of the SF-36, women under age 50 are above the population-based norm of 50 points on the SF-36 scale. Physical health declines quite sharply beyond age 50 but there is a less steep decline with age in the four mental health measures. The narrowness of the health differentials by socio-economic status (education or household wealth) is surprising. The explanation is unclear but possible causes include the range of public health services available to all, with access widening with the new national health insurance scheme; as well as the similar occupational and other exposures shared by women, most of whom are self-employed in commerce and trade rather than more hazardous manufacturing industry.

For the BMI and the waist/hip ratio, however, we find that with the exception of the first age group, all the average measures are beyond the ideal threshold for good health. Systolic blood pressure over 140 mm Hg also increased steadily from under 2.4% in the under 24-year old age group to over 57% in the women over age 75. Both the public health and the clinical services need to include preventative care more systematically to deal with the new predominance of non-communicable disease conditions.

An important methodological finding is that there is good correspondence between the self-reported and objectively measured dimensions used here. In addition, the responses of Accra women to the standardised SF-36 questions have been shown to be consistent with

studies elsewhere, pointing the way to wider use of such questions to capture levels, trends and differentials in population health in the future. The two sorts of measures capture different dimensions of health and both are needed to produce a rounded picture of a population's health, especially when some conditions are asymptomatic (e.g. early stage diabetes) or risk factors without an immediate connection to ill health (e.g. obesity – a known risk factor for hypertension and diabetes is not generally regarded by the population as an 'illness').

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