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The Association of Television and Radio with Reproductive Behavior

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Exposure to television in developing countries has increased rapidly in recent decades. In Asia, one estimate in 2003 indicated a six-fold increase to 650 million television sets since the 1980s (Thomas 2003). In China alone, the number of people with access to satellite cable TV increased from 270,000 in 1991 to 14 million by 2005 (Jensen and Oster 2009). Data collected in the Demographic and Health Surveys show steady increases in television exposure over the past two decades. In light of this development, it is timely to revisit earlier studies of the association of mass media exposure with reproductive behavior. One study in Africa (Westoff and Bankole 1997) concluded that exposure to radio, television, and print media was “significantly and often strongly associated with reproductive behavior even with all of the many controls imposed.” Similar results were reported two years later for Bangladesh, India, and Pakistan (Westoff and Bankole 1999). A more recent study in India concluded that the introduction of cable television lowered fertility. The authors noted in this connection that “television may affect fertility by providing information on family planning services or changing the value of women’s time” or that “television exposes rural households to urban lifestyles, values and behaviors that are radically different than their own” (Jensen and Oster 2009). Another recent study in South Korea concluded that “the perceived prevalence of having fewer children in married life was significantly affected by exposure to dramas which positively feature single life and having fewer children in married life on television” (Jin and Jeong 2010).

The study reported here, part of a lengthier report on the impact of television and radio on reproductive behavior and knowledge of HIV/AIDS (Westoff, Koffman, and Moreau 2011), examines the frequency of watching television and listening to radio in connection with the use of modern methods of contraception, the number of children desired by married women, and the number of recent births. No information is available about the content of what is viewed or heard. Soap operas are thought to have the greatest influence on values associated with fertility. In general, “television programs— which often portray urban rather than rural ways of living, that glamorize consumerism and paint a picture of social mobility and achievement—have influenced many villagers, especially the young, into rejecting rural and agricultural life for modern ways of living” (Johnson 2001). In another study of mass media effects in India, an increase of 16 percentage points in the use of contraception (with relevant controls) was associated with media exposure (Retherford and Mishra 1997). Similar results have been reported for Nepal (Barber and Axinn 2004), along with a useful catalogue of hypotheses about the mechanisms connecting media exposure and reproductive behavior. The authors concluded: “Both premarital and lifetime exposure to mass media are associated with higher rates of permanent contraceptive use” and with a preference for smaller families and contraceptive use in general. A similar description of alternative

The figure in this article is available in color in the electronic edition of the journal.

This article is derived from the first half of a report by Westoff, Koffman, and Moreau (2011). That report includes analyses of male reproductive behavior and the influence of the media on HIV/AIDS in sub-Saharan Africa, and gives results of the regression analyses at the country level.

pathways by which television exposure can affect fertility is included in an essay by Hornik and McAnany (2001), which also summarizes the difficulties surrounding the inference of cause and effect of media impacts.

Data

The analysis in this report is based on interview data collected from more than half a million women conducted over the past decade in the Demographic and Health Surveys in 48 developing countries.¹ The national surveys are confined to those conducted between 2000 and 2008 and include only the most recent survey in each country. The samples are mostly restricted to currently married women aged 15–49, with supplementary analyses of young, never-married women aged 15–24 in 41 of the 48 countries. When aggregated by region, the countries are weighted equally to avoid the dominance of countries with large populations and/or large samples. The total number of currently married women is 512,260, and the 48 countries are divided into four regions (see Table 1).

Television and radio exposure

The main measure of television exposure is the standard question in the DHS: “Do you watch television almost every day, at least once a week, less than once a week, or not at all?” Only a few countries omitted the question, and in some of the analyses ownership of a television was substituted. A similar question on the frequency of listening to the radio has also been routinely included in the DHS.

There is a clear difference in the amount of television but not radio exposure between the two regions making up sub-Saharan Africa and the other two regions (see Figure 1). It is important to determine the characteristics of television viewers and radio listeners, who are obviously not randomly represented in the surveys. A multivariate logistic regression of factors associated with watching television (not shown) indicates that such audiences are much better educated, wealthier, predominantly urban, and slightly older. The association of television viewing with wealth is particularly strong in sub-Saharan Africa. Because these characteristics are also associated with reproductive behavior, they are included in later analyses as well. Listening to radio compared with watching television is less closely associated with education but remains positively correlated with wealth and is connected with rural rather than urban residence. Women who watch television daily have fewer children, while radio listening shows little association with past fertility. A positive association is found between watching television and listening to radio.

Associations with reproductive behavior

The frequency of watching television is clearly and fairly strongly associated with the use of a modern method of contraception, with the number of children desired, and with the percent of women who had no births in the past 5 years (see Table 2). In these bivariate analyses, all three measures of reproductive behavior are more clearly influenced by television than by radio.

¹ The 48 developing countries, by region and year of DHS survey, are: *Asia and North Africa*: Armenia 2005, Azerbaijan 2006, Bangladesh 2007, Cambodia 2005, Egypt 2008, India 2005, Indonesia 2007, Jordan 2007, Morocco 2004, Nepal 2006, Pakistan 2007, Philippines 2008, Ukraine 2007; *Latin America and Caribbean*: Bolivia 2004, Colombia 2005, Dominican Republic 2007, Haiti 2006, Honduras 2006, Nicaragua 2001, Peru 2005; *West and Middle Africa*: Benin 2006, Burkina Faso 2003, Cameroon 2004, Chad 2004, Congo (B) 2005, Congo (DR) 2007, Gabon 2000, Ghana 2008, Guinea 2005, Liberia 2007, Mali 2006, Niger 2006, Nigeria 2008, Senegal 2005, Sierra Leone 2008; *Eastern and Southern Africa*: Ethiopia 2005, Kenya 2009, Lesotho 2004, Madagascar 2009, Malawi 2004, Mozambique 2003, Namibia 2006, Rwanda 2005, Swaziland 2006, Tanzania 2004, Uganda 2006, Zambia 2007, Zimbabwe 2006.

We next determine whether these bivariate associations persist in the context of other predictors of reproductive behavior, such as education, wealth, and urban residence. Multivariate analyses are presented below at the regional level, while summaries for the 48 individual countries are addressed subsequently.

The media and contraceptive use

The multivariate analyses in Table 3 include current use and past use. The measure of past use is included to represent women who are currently not using any modern method for reasons including being pregnant or trying to become pregnant, sterility, and infrequent intercourse.

The multivariate analyses in Table 3 include television and radio exposure, education, wealth, urban/rural residence, number of children, child mortality, and age simultaneously considered with the use of modern methods of contraception. Our main focus is on the top two panels. For all countries combined, women who watch TV only sometimes are 1.6 times more likely to use modern contraception than are women who watch no television. This ratio increases to 2.4 for women who report daily exposure to television. Overall, the odds of using modern contraception are roughly 2 to 1 for women who watch TV. A similar outcome occurs with past use of modern contraception. Education and wealth also exert an influence on the use of modern contraception, with odds ratios in the expected direction of greater use by women with higher socioeconomic status. Although the frequency of listening to the radio is significantly related to contraceptive use, the magnitude of the association is weaker than for television. In the Latin America and Caribbean region, no association is seen between radio listening and the use of modern contraception.

The media and the number of children desired

Conceptualizing television and radio as windows to the outside world, with many of its activities and implied values antithetical to traditional behavior, it is easy to imagine some effect of the media on the ideal number of children. Table 2 shows that the average number of children desired by women in DHS surveys ranges from 5.2 for women who do not watch television to 3.2 for those who are daily viewers. The largest differences are in sub-Saharan Africa and the smallest in Asia and North Africa. As noted above, the influence of television on the number of children desired is greater than the influence of radio.

In the “all countries” column in the multivariate analysis in Table 4, the association between the number of children desired and watching television is quite strong compared with the other covariates with the exception of the actual number of children, which would obviously be highly associated with the total number desired. The magnitude of the television coefficient is approximately the same as that for years of schooling.

In Asia and North Africa, unlike in any other region, watching television is directly rather than inversely associated with the number of children desired. In that region, the television variable is negative initially but becomes positive with the inclusion of schooling. In the other three regions, both television watching and education remain negatively correlated with the number of children desired when all of the covariates are included. The pattern of the associations in these three regions in general is very similar.

A question arises about the extent to which general exposure to television and radio influences contraceptive behavior beyond the effects of targeted messages advertising the benefits of family planning. Among all countries in this analysis, such messages had been seen on television in the past month by 27 percent of the women and heard on radio by 40 percent. When this information is added (not shown here) to the multivariate analysis in

Table 3, its effect on current use of modern contraception is to lower the odds ratio of daily television exposure from 2.4 to 2.1 and of daily radio exposure from 1.3 to 1.2. Of course, there are regional and country variations but the basic conclusion is that the importance of general media exposure for contraceptive behavior is not significantly diminished by these targeted messages.

The media and recent fertility

Ultimately, the fertility rate is related to both the number of children desired and contraceptive behavior. Initially we focused on the relationship between television exposure and the number of children ever born. However, in our sample of women aged 15–49, this is too long a time period in connection with the timing of exposure to television. The number of children born in the preceding five years is preferable, and it shows a consistent decrease with television exposure (Table 2). For all countries combined, 52 percent of women who watch TV every day report no births in the past 5 years compared with 30 percent who do not watch TV. A similar but weaker association appears in each of the four regions. This association is reviewed in the multivariate context in Table 5. Television exposure is significantly associated with the number of children born in the past five years in the four regions, with greater exposure linked to fewer births, while radio listening in contrast is very weakly related.

Country-level analyses

The association of media exposure with reproductive behavior has been reviewed thus far at the regional level. Two tables that appear in the longer version of this analysis summarize for each country the main results for the influence of television and radio on reproductive behavior. The first table provides descriptive statistics on television and radio exposure and on the use of modern contraception for all 48 countries along with the odds ratios connecting the two that are derived from an application of the multivariate analyses described earlier. Two sets of odds ratios for both TV and radio are included: the unadjusted odds ratios with no other covariates and the adjusted odds ratios, which include the simultaneous associations with the seven other covariates, including education and wealth. While daily television exposure is the measure used for the more developed countries, any TV exposure is used for the sub-Saharan African countries. Here we briefly mention results using the adjusted odds ratios.

The countries with the highest odds ratios for TV exposure on the use of modern contraception (with the seven other covariates controlled) are Mali (2.0) and Niger (2.7). All of the 48 country analyses show a positive connection of television exposure with contraceptive practice, 30 of which are statistically significant. The differences between the unadjusted and the adjusted odds ratios are quite large, especially in sub-Saharan Africa, which means that the covariates (particularly education and wealth) play an important role in the connection between contraceptive practice and watching television. An extreme example is Niger, where the odds of using modern contraception are 8.5 times greater for women who report any television viewing compared with no such exposure. With all of the controls added, the odds ratio drops to 2.7, but this is still a considerable effect. In Ethiopia, the unadjusted odds are 5.8 compared with the adjusted estimate of 1.4. Such large differences are not seen in Asia and North Africa. With a few exceptions in sub-Saharan Africa, television exposure shows a stronger association with the use of modern contraception than radio exposure.

Never-married young women

The preceding analysis has focused exclusively on currently married women aged 15–49. Analyzing never-married women aged 15–24 who have never had children allows us to explore whether television or radio influences women's desired number of children before marriage and childbearing. The frequency of media exposure for these young women in all countries combined indicates 42 percent daily TV viewing and 47 percent daily radio listening. As with married women of all ages, TV exposure is more limited in sub-Saharan Africa.

The association of the number of children desired with the frequency of watching television and listening to radio is shown in Table 6. For all countries combined (weighted equally), the range is from 2.8 children among daily viewers to 4.0 for women who watch no TV. With the exception of radio exposure outside of sub-Saharan Africa, the average number of children desired declines with the amount of media exposure.

For all regions, the association of television exposure with the number of children desired is statistically significant, with frequent media exposure (mainly television) associated with a desire for fewer children (not shown). Except in Latin America and the Caribbean, the amount of schooling shows a stronger association than television. Rural residence shows a positive association with the number of children desired in each region.

In the individual country-level analysis (not shown), exposure to television is significantly associated negatively with the number of children desired by young women in 27 of the 41 countries, while listening to radio shows significant coefficients in only 12 countries, one of which is positive (the 2007 Liberia DHS shows more children desired by women who listen to radio). Typically, education is more influential than television, and living in rural areas shows a direct association with reproductive preferences in virtually every country.

Summary

This analysis sought to determine the association of reproductive behavior with exposure to television and radio. Such exposure has increased markedly in the developing world over the past few decades, in conjunction with rising levels of contraceptive prevalence and declining rates of fertility. We focused on the use of modern methods of contraception, the number of children desired, and the number of children born in the past 5 years. The main shortcoming of the study is that we have no information about the content of television or radio programs or which programs are relevant to reproductive behavior. The literature suggests that soap operas are likely to be the most influential in altering values and changing behavior. The basic assumption is that television, even more than radio, exposes viewers to aspects of modern life that compete with traditional attitudes toward marriage and the family and lead to views and behavior conducive to the control of fertility.

Television viewing is strongly associated with reproductive behavior: the more television that women watch, the more likely they are to have used modern contraceptives, the fewer children they want (even among young never-married women), and the fewer children they have. These findings persist in the presence of controls for education, wealth, urban residence, age, and other covariates. In this multivariate context, across all 48 countries, women who watch television are two times more likely to have used modern contraception than those who have not (three times more likely with no controls). In general, the magnitude of the association with the frequency of exposure to television is greater than with the more conventional covariates. By and large, the influence of television exposure on reproductive behavior is greater than that of radio, although some exceptions are seen in sub-Saharan Africa.

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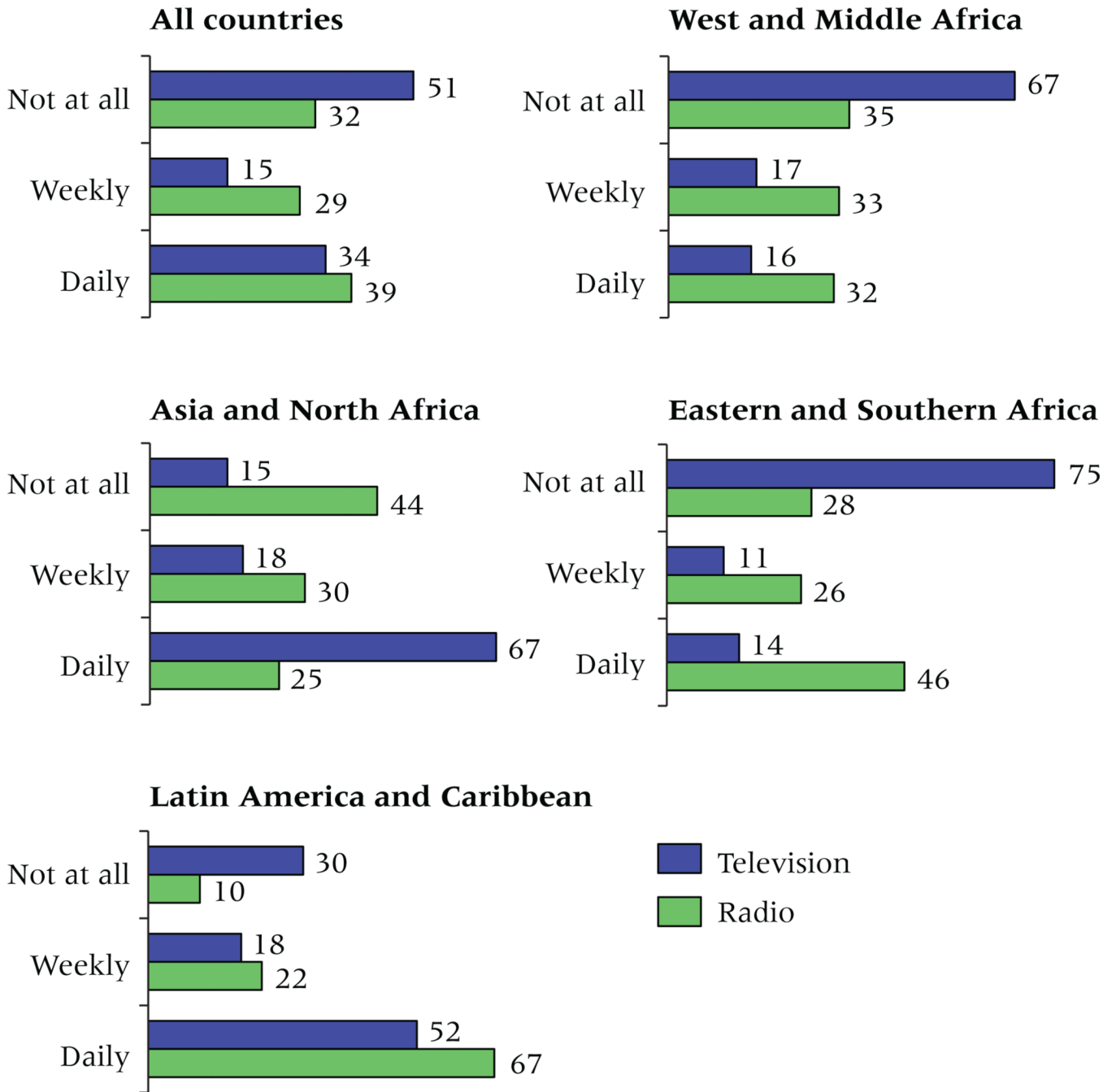


FIGURE 1. Frequency of television and radio exposure of currently married women, by region (percent)
 NOTE: Countries are weighted equally. For countries in each region see endnote ¹.

TABLE 1

Number of countries and married women aged 15–49 in four regions

Region	Countries	Women
Asia and North Africa	13	226,844
Latin America and Caribbean	7	83,189
West and Middle Africa	15	123,467
Eastern and Southern Africa	13	78,760
Total	48	512,260

NOTE: For countries in each region see endnote 1.

TABLE 2

Television and radio exposure and reproductive behavior among married women aged 15–49 in four regions

Media exposure	Percent using modern contraception		Mean number of children desired		Percent having no births in past 5 years	
	TV	Radio	TV	Radio	TV	Radio
All countries						
Not at all	19	23	5.2	4.7	30	38
Sometimes	31	27	4.0	4.4	42	38
Daily	43	36	3.2	4.0	52	42
Asia and North Africa						
Not at all	36	37	3.1	3.0	46	55
Sometimes	39	42	3.0	3.0	51	52
Daily	50	44	2.9	2.8	58	59
Latin America and Caribbean						
Not at all	38	48	3.6	3.3	37	40
Sometimes	43	45	3.0	3.1	49	47
Daily	58	51	2.9	3.1	55	50
West and Middle Africa						
Not at all	5	5	6.3	6.6	28	28
Sometimes	13	9	5.3	5.7	34	30
Daily	19	13	4.9	5.5	38	34
Eastern and Southern Africa						
Not at all	25	23	4.8	5.0	28	28
Sometimes	38	27	4.1	4.7	37	30
Daily	54	38	3.4	4.2	45	35

NOTE: For countries in each region see endnote 1. Pakistan and Colombia are not included.

Table 3

Multivariate logistic regression (odds ratios) of factors related to (1) currently using a modern method of contraception and (2) ever used a modern method among those not currently using a modern method, married women aged 15–49 in four regions

Covariates	All countries		Asia and North Africa		Latin America and Caribbean		West and Middle Africa		Eastern and Southern Africa	
	Using	Used	Using	Used	Using	Used	Using	Used	Using	Used
Watch television										
Never	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sometimes	1.64	1.51	1.16	1.37	1.37	1.38	1.44	1.52	1.26	1.46
Everyday	2.39	1.64	1.32	1.54	2.41	1.75	1.65	1.62	1.72	1.99
Listen to radio										
Never	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Sometimes	1.09	1.29	1.16	1.19	0.89	(1.02)	1.39	1.44	0.94	1.12
Everyday	1.31	1.57	1.29	1.43	0.92	(0.95)	1.57	1.44	1.15	1.44
Schooling										
No schooling	0.48	0.33	1.40	(1.04)	0.57	0.64	0.45	0.27	0.40	0.37
Elementary	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
More	1.18	1.31	(0.97)	(1.03)	1.17	1.52	1.33	1.80	2.00	2.12
Wealth										
Lowest quintile	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Next-to-lowest	1.10	1.11	1.28	1.20	(1.05)	1.28	(1.07)	1.18	1.29	1.21
Middle	1.13	1.20	1.41	1.35	(1.02)	1.54	1.34	1.30	1.40	1.28
Next-to-highest	1.18	1.26	1.66	1.52	(0.98)	1.60	1.55	1.36	1.49	1.23
Highest quintile	1.16	1.35	2.06	1.95	0.90	1.72	1.71	1.28	1.43	1.18
Residence										
Urban	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Rural	(0.99)	0.83	(0.99)	0.90	0.92	0.78	0.74	0.65	0.78	0.71
Age	0.99	(1.00)	0.98	0.99	0.99	0.97	0.98	(1.00)	0.98	(1.00)
Number of children	1.15	1.14	1.24	1.33	1.14	1.17	1.17	1.07	1.17	1.14
Child deaths	0.69	0.92	0.78	0.93	0.71	(0.99)	0.88	0.98	0.77	(1.00)
Number of women	451,294	298,842	203,888	109,059	51,315	25,320	117,521	107,646	78,570	56,817

NOTE: For countries in each region see endnote 1.

() not significant at the .05 level

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TABLE 4

Multivariate analysis of factors associated with the number of children desired^a by married women (standardized partial regression coefficients)

Covariates	All countries	Asia and North Africa		Latin America and Caribbean		West and Middle Africa		Eastern and Southern Africa	
Watch TV	-.185	.041	-.028	-.066	-.018				
Listen to radio	-.034	-.006	.015	-.067	-.034				
Years of schooling	-.170	(.000)	-.038	-.106	-.226				
Wealth	.043	-.096	-.041	(-.003)	-.072				
Rural residence	-.010	-.010	.039	-.024	(-.000)				
Number of children	.282	.485	.212	.297	.251				
Age	-.084	-.043	.092	-.087	(.007)				
Child deaths	.130	.077	.024	.117	.071				
Number of women	451,294	203,888	51,315	117,521	78,570				

NOTE: For countries in each region see endnote 1.

^aFor women who provide a non-numeric response, number of living children was substituted. That number was reduced by 1 if last child was not wanted. Similar results are obtained when women who provide a non-numeric response are excluded.

() not significant at the .05 level

TABLE 5

Multivariate analysis of factors associated with the number of children born in the past 5 years, currently married women (standardized partial regression coefficients)

Covariates	All countries	Asia and North Africa	Latin America and Caribbean	West and Middle Africa	Eastern and Southern Africa
Watch TV	-.153	-.038	-.117	-.040	-.069
Listen to radio	.006	-.012	-.045	-.010	(.006)
Years of schooling	-.066	(.015)	-.049	-.060	-.075
Wealth	-.039	-.118	-.095	-.038	-.067
Rural residence	.013	-.031	.011	.021	.046
Age	-.315	-.413	-.367	-.242	-.281
Number of women	451,294	203,888	51,315	117,521	78,570

NOTE: For countries in each region see endnote 1.

() not significant at the .05 level () not significant at the .05 level

Table 6

Mean number of children desired by frequency of watching television and listening to the radio, by region: never-married women aged 15–24 with no children

Frequency of media exposure	All countries		Asia and North Africa		Latin America and Caribbean		West and Middle Africa		Eastern and Southern Africa	
	TV	Radio	TV	Radio	TV	Radio	TV	Radio	TV	Radio
Not at all	4.0	3.8	2.4	2.2	2.6	2.4	5.0	5.0	3.5	3.5
Weekly	3.3	3.4	2.3	2.3	2.4	2.4	4.2	4.3	3.2	3.4
Daily	2.8	3.0	2.2	2.2	2.3	2.3	4.0	4.2	2.8	3.1
All		3.3		2.2		2.3		4.4		3.3

NOTE: For countries in each region see endnote 1.