Village Health Workers

Proceedings of a workshop held at Shiraz, Iran, 6-13 March 1976

Editors: H.A.Ronaghy, Y. Mousseau-Gershman, and Alexandre Dorozynski
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The views expressed in this publication are those of the individual authors and do not necessarily represent the views of IDRC.
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Evaluation of Iranian Village Health Workers Efficacy
Bahram Zeighami and Elaine Zeighami

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Shiraz, Iran

Useful and methodologically sound evaluation of the VHW's work is of fundamental importance in the Iranian project and has been carried out by the research unit of the Department of Community Medicine. It is never possible to carry out all the evaluation that would be useful in a project of this magnitude. Monetary, personnel, and time limitations restrict studies to those most feasible and necessary. In addition, although one usually cannot design evaluation that is ideal in every respect, it is useful to have some model according to which such evaluation is incorporated into the project.

The first step in planning any auxiliary program must certainly be to choose the broad objectives of the auxiliary's work. Auxiliary projects differ widely in their objectives, some having a very specific, narrow range of objectives, others, a broader one. After the objectives have been set, the next step is to choose the personnel and methods by which these objectives are to be achieved. At this point, evaluation of the methods and results should be arranged. Planning for evaluation should include several considerations:

- For the objectives of the program, evaluation measurements should be chosen that are as directly related to the objectives as possible. For example, if the objective of the program is to reduce infant mortality, then the evaluation should obtain accurate measurements of infant mortality.

- If in the course of the planning of the program, significant questions arise concerning the methods, personnel, location, training, and so on, then it is also in the planning stage that studies should be designed to provide answers to these questions. For example, if there are questions concerning the association of certain characteristics of the auxiliary with his acceptance, or with some other criterion of success, then studies should be designed to investigate these relationships.

- Certainly one should always avoid the temptation simply to accumulate facts. When facts have no discernible application to some specific hypothesis, then the time and effort spent in accumulating them is, for the most part, wasted from the point of view of evaluation. This is the major reason why evaluation should be designed in the planning stages of the program.

When one makes choices about what will be evaluated and how it will be done, several factors should be considered: (a) what studies are most needed; (b) what measurements can be most accurately obtained; (c) limitations of cost; and (d) for which studies adequate control or comparison can be obtained.

This last consideration leads us to the next step — frequently the most difficult aspect of carrying out successful evaluation studies — that of choosing an adequate basis for comparison. There are essentially two types of comparison one can make: first, one can use the study population as its own control, taking the situation that existed before the auxiliary arrived as the control measure. Thus, one might look at the infant mortality rate before the arrival of the auxiliary to assess the auxiliary's effect.

The primary methodological difficulty encountered in such a study is that one is measuring changes over time, hence questions may arise as to how much of the change can be attributed to the auxiliary and how much should be attributed to factors that have changed during that time period. The greater the time elapsed between initial and final measurements, the greater the possibility of variation through changes in other factors.

The second method of comparison is to select a control population that has no auxiliary, but in all other respects is as similar as possible to the study population. The key to the methodological difficulties in this control technique is contained in the phrase "as similar as possible." There may be instances in which it is not possible to choose a control population for which similarities with the study population are adequate. In addition, there may be underlying differences between the study and control populations that are not easily detected. In this type of study, the investigator must establish the likeness of the two populations, rather than merely assume it.
After studies have been designed, measurements are taken periodically. The results can then be applied (i.e., to demonstrate applicability and effectiveness, whether positive or negative) or used in changing the original decisions concerning objectives, personnel, and methods. The results of evaluation of one auxiliary program may be useful to others who are designing or conducting auxiliary programs in other areas.

Three Studies Completed

Three evaluation studies have been completed in the Kavar auxiliary project and two more are in the data collection stage. In all our studies for which comparisons were needed, a control population was used. All control villages are in the Kavar area, closely situated to the study villages, and are, as far as is possible to determine, extremely similar to the project villages, socially, economically, and demographically.

The first completed study, called the Acceptance Survey, was conducted 6 months after the arrival of the VHW. Its purpose was to obtain some objective measure of the level of acceptance of the auxiliary and to determine whether certain of the auxiliary's characteristics were related to his acceptance by the villagers.

The second study was the family planning survey. A major objective of the auxiliary program is to increase family planning and the use of oral contraceptives in the villages. This includes increasing the level of knowledge about contraception and altering attitudes about family planning.

The third study, and the most ambitious of the three, was the measurement of vital rates, to determine the auxiliary's impact on mortality and on birthrates.

Two studies in our evaluation program remain to be completed. The first is an evaluation of the ability to diagnose and treat patients (auxiliary's) by comparing his diagnosis, prescribed treatment, and decision on referral or nonreferral, with those of a physician on the same patient. The cooperating physician sees the patient and records his diagnosis and prescription without knowledge of the auxiliary's conclusions. Comparisons of the diagnosis will be made by an independent observer, who will not know which diagnosis has been made by whom.

The final study planned is the assessment of the auxiliary as a health educator, by comparing levels of knowledge about health, disease, and disease prevention in auxiliary versus control villages.

The acceptance survey was conducted on a sample of the adults in project villages. The group was chosen by taking a systematic sample of one-tenth of the residences in each village after a random start. Each adult in a household (except for a few persons who were never located) was interviewed individually by different members of the research team.

The response to the presence of the VHW was generally highly favourable; 220 of the 226 villagers interviewed responded that they were happy with the VHW's work.

The most negative response was given to the question: "Do you think the VHW knows enough?", to which 19% of the sample said they did not feel the VHW knew enough.

An enquiry was made to see if any known characteristics of the VHW were associated with the belief that the VHW "did not know enough." The villagers response indicated no difference between male VHWs and female VHWs, or between VHWs in their own villages and from other villages. There was no relationship between the social class of the VHW and the villagers' perceptions of his knowledge.

"Do you think the VHW knows enough?"
There was, however, a relationship between the age of the VHW and the percentage of villagers who did not feel that the VHW knew enough. The villages with a young health worker contained, on the average, a considerably higher proportion of persons who felt that the VHW lacked adequate knowledge than did the villages with an older VHW. The correlation coefficient for the linear relationship between the age of the VHW and percentage of negative responses in the sample group was \( r = -.60 \).

Thus, the villager tends to have more confidence in the older health worker's knowledge than in the younger's, even after some direct experience. The common belief in the villages that wisdom increases with age, particularly in matters concerning health, probably accounts for the relationship observed here. Since other measures of attitude did not vary by age, and since studies did not reveal any reluctance of persons to visit younger VHWs, it appears that this particular prejudice has not hampered the VHWs' work. However, the fact remains that the young VHW probably must overcome more skepticism concerning his abilities.

The mean attitude score in each village was computed and the values analyzed according to various characteristics of the VHW. The possible range for any person's score was -4 to +4. Those villages with a male VHW had a somewhat higher mean attitude score than those with a female VHW: +3.45 for males, compared to +2.99 for females. This difference was not significant \( (t = 1.26, p > .10) \). There was no difference between the attitude scores of those who had a VHW from their own village, and those who did not.

Table 1 shows the responses by villagers to each of the questions about the VHW. Each of the respondents was asked to give the most correct answer among those listed under question 6. Seventy-five percent said that the VHW knew more about medicine than most of the people in the village. Those who gave an incorrect answer were far more likely to overrate the VHW's knowledge than to underrate it: 47 people responded that the VHW knew as much as a doctor. The mean knowledge score in the villages did not vary according to the age or sex of the VHW or whether the VHW was a native of the village or not, and showed no correlation with the attitude scores.

Each villager was asked whether he preferred the VHW to be male or female. The responses were analyzed by sex of the respondent and by sex of the VHW. Results showed that males generally preferred males and females preferred females. However, more detailed analysis showed that among

Table 1. Responses by villagers to questions about the VHW.

<table>
<thead>
<tr>
<th></th>
<th>Correct</th>
<th>Incorrect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Name of VHW</td>
<td>206</td>
<td>19</td>
</tr>
<tr>
<td>2. Where VHW is from</td>
<td>208</td>
<td>16</td>
</tr>
<tr>
<td>3. Length of VHW's training</td>
<td>100</td>
<td>110</td>
</tr>
<tr>
<td>4. Trained by whom</td>
<td>49</td>
<td>157</td>
</tr>
<tr>
<td>5. Measures taken to improve sanitation in the village:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talked about cleanliness</td>
<td>203</td>
<td>23</td>
</tr>
<tr>
<td>Talked about separating animals from houses</td>
<td>183</td>
<td>43</td>
</tr>
<tr>
<td>Talked about clean water</td>
<td>188</td>
<td>38</td>
</tr>
<tr>
<td>Cleaned his own house</td>
<td>171</td>
<td>55</td>
</tr>
<tr>
<td>Helped the villagers to clean their houses</td>
<td>198</td>
<td>28</td>
</tr>
</tbody>
</table>

6. In your opinion about medicine, the VHW knows:

<table>
<thead>
<tr>
<th></th>
<th>as much as you know</th>
<th>more than most of the people in the village</th>
<th>as much as a doctor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9</td>
<td>165</td>
<td>47</td>
</tr>
</tbody>
</table>

16
those males who have a male VHW, 71% prefer a male; another 24% say that it makes no difference. Among those males who have a female VHW, on the other hand, only 8% said they preferred a male. The remaining 92% say they prefer a female or that the sex of the VHW makes no difference. Thus, the attitudes of males toward female health workers were heavily influenced by direct experience with a female VHW. Among female respondents, preference was also influenced by experience. Among those women who had a female VHW, 64% said they preferred a female VHW. However, among those with a male VHW, only 35% definitely preferred a female. Thus, females were also influenced by experience, but less so than the males.

Persons participating in the survey were asked the question: "Do you prefer the VHW to be from your own village or another village?" Eighty-one percent said they wished the VHW to be from their own village. However, the results already presented show that there is little difference in actual attitude toward the VHW who works in his home village and one who does not. The second group of VHWs has been more widely recruited, in an effort to obtain the best qualified personnel, without attempting to recruit people from the same villages to which they will be sent.

Regarding the family planning survey, the proportion of current users of oral contraceptives among married women in VHW and in control villages, by age, is shown in Fig. 1. This was the proportion of women responding positively to the question "Are you now using any form of contraception?" among those included in a one-tenth systematic sample of residences. The VHW's function is solely to serve as a provider of oral contraceptives; he is supplied with no other type of contraceptive. The control villages are supplied by a rural midwife, who theoretically also supplies the IUD. However, in our survey we found very few women in either location using any form of contraception besides the pill, and it is an accepted fact that very few village women use the IUD.

Fig. 1 illustrates the vast differences in pill use between auxiliary and control villages. The greatest differentials occurred in the middle childbearing years. Again, to
provide some check on the accuracy of responses, we compared the proportion of current users in our sample with the proportion obtained by referring to the VHWs' records; the VHWs' records yielded an estimate of 26.4% compared to the survey estimate of 27.8%.

Estimates of length of usage were obtained from the auxiliaries' and midwives' records since it has been observed that most women, particularly those who have discontinued use, cannot estimate accurately the number of months for which the pill was used. The first-year termination rate was computed using the ratio:

\[
\text{termination rate} = \frac{\text{no. of terminations in the 1st year}}{\text{person-years of use in the 1st year}}
\]

The termination rate in the midwife villages was 30.2 per 100 woman-years of use, compared to 25.6 per 100 woman-years of use in the auxiliary villages. This result is important because it demonstrates that the increase in pill use in auxiliary villages has not been among women who simply took a packet of pills once because they were urged to by the VHW.

Table 2 shows the proportion of married males and females who know about the various methods of contraception. The question was open-ended, but each person was encouraged to give as many responses as he or she knew. The only category with substantial and consistent differences in response was the pill. Among married females, 91% knew of the existence of the pill compared to 64% in the control villages. The difference in knowledge among males was less, but still substantial.

Single persons in both auxiliary and control villages had essentially no knowledge of any contraceptive technique other than oral contraceptives. In the category of oral contraceptives, however, there were substantial differences in knowledge. Of single females in the VHW villages, 83% knew about the pill compared to 44% in the control villages. For single males the figures were 75% and 51%. Thus, the VHW has had an effect on knowledge of the pill in all adult groups, particularly among single females.

Table 3 gives the comparison of responses to the question: "How do you feel about using some method to prevent pregnancy?" Since the answers did not vary substantially by age, only percentages of the total are presented. With the exception of single females, the proportion in each group who said they completely agree with the use of contraception was higher in the VHW villages. However, the difference was not great in any group, and it seems clear that the VHW has not had as great an effect on attitudes toward contraception as he has had on usage and knowledge of the pill.

One matter of prime interest in the survey was to determine whether the sex of the VHW was related to contraceptive usage and continuation in the village. Rural villages of Iran remain a traditional male-dominated Moslem society, in which physical contact and discussion of sexually related matters between males and females is severely limited. Thus, there are legitimate doubts about the ability of a male VHW to serve as an educator and supplier of con-

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Footnote:

4Coitus interruptus, rhythm, diaphragm, injection, or condom. Since the question was open-ended, the number of responses for coitus interruptus and rhythm was less than the number who knew of these methods. The few people who gave more than one of the answers are counted twice in the numerator of this column.
Table 3. Attitudes toward use of contraceptives.

<table>
<thead>
<tr>
<th></th>
<th>Completely agree</th>
<th>Partially agree or neutral</th>
<th>Somewhat disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VHW</td>
<td>76</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>Control</td>
<td>69</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VHW</td>
<td>66</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>Control</td>
<td>70</td>
<td>23</td>
<td>7</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VHW</td>
<td>70</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Control</td>
<td>64</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VHW</td>
<td>78</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>Control</td>
<td>73</td>
<td>25</td>
<td>7</td>
</tr>
</tbody>
</table>

Contraceptives for rural village women. The results, however, allay those doubts. The proportion using oral contraceptives was very similar in the villages with male VHWs to those with female VHWs. Twenty-nine percent of married women aged 15-44 in the villages having a female VHW were users, compared to 27% of those whose VHW was male. Continuation rates for the first year of use were also similar.

In order to test the validity of the comparison of the two groups and of the survey methods, a number of other questions concerning attitudes toward marriage, relationship of husband and wife, ideal number of children, etc., were also asked. It was felt that the VHW almost certainly would not affect attitudes or opinions in these social areas. Hence, consistent differences would signal either fundamental differences in the populations or the samples, or an undetected bias in the survey techniques. The results showed no consistent differences between the responses of the VHW villages and the control villages.

In summary, the results of the survey indicate that both the male and female auxiliaries have had a substantial and worthwhile impact in the area of family planning, and in education on contraception. The impact of the auxiliary on attitudes toward family planning, at least as measured by the survey, was not substantial.

**Mortality and Birthrate**

The last project, and probably the most fundamental of the three, was the comparison of mortality and birthrates in auxiliary and control villages. This census was conducted on the entire populations of both auxiliary and control villages, rather than on random groups as done in the first two studies. This, of course, was because the stable estimation of the event rates required the entire population base.

Vital rates showed rather large differences. The infant mortality rate (IMR) for the control villages was close to the figure of 120 live births quoted for Iran as a whole. The observed IMR in the auxiliary villages was almost half that of the control villages.

This does not imply necessarily that the IMR in auxiliary villages will always be half that of villages without auxiliaries, even if only random variation is taken into account. In Table 4 the values listed in parentheses are 95% confidence limits on the estimate of the IMR. The upper and lower 95% confidence limits for the IMR in auxiliary villages were 50 per 1000 live births, and 78 per 1000 live births, respectively. The setting of confidence limits is related only to random variation, and does not consider underreporting or the possibility of underlying differences between groups. As mentioned before, every effort was made to ensure the comparability of the auxiliary villages, and the measurements found for other demographic indices indicate that such comparability did indeed exist. However, it is never possible in human population studies to assure absolute comparability of experimental and control groups; hence, the possibility that part of the differences found in rates was due to systematic differences in populations cannot be totally eliminated.

The crude death rate also exhibited a considerable drop, 10.2 per 1000 in the auxiliary villages compared to 17.5 in
Table 4. Comparison of vital rates in VHW villages and control villages. (Values in parentheses are 95% confidence limits.)

<table>
<thead>
<tr>
<th>Index</th>
<th>VHW villages</th>
<th>Control villages</th>
<th>Significant difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortality and fertility</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant mortality rate</td>
<td>64/1000 live births (50–78)</td>
<td>124/1000 live births (97–150)</td>
<td>*p &lt; .01</td>
</tr>
<tr>
<td>Crude death rate</td>
<td>10.2/1000 population (8.0–12.4)</td>
<td>17.5/1000 population (15.2–19.8)</td>
<td>*p &lt; .01</td>
</tr>
<tr>
<td>Fetal death ratio&lt;sup&gt;a&lt;/sup&gt;</td>
<td>36/1000 live births</td>
<td>79/1000 live births</td>
<td>*p &lt; .01</td>
</tr>
<tr>
<td>Total fertility rate&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.41</td>
<td>6.96</td>
<td>Not significant</td>
</tr>
<tr>
<td>Crude birthrate</td>
<td>40.2/1000 population (35.8–44.6)</td>
<td>44.9/1000 population (41.3–48.5)</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

**Other demographic measures**

<table>
<thead>
<tr>
<th>Index</th>
<th>VHW villages</th>
<th>Control villages</th>
<th>Significant difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age, males</td>
<td>12.3</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Median age, females</td>
<td>12.2</td>
<td>12.7</td>
<td></td>
</tr>
<tr>
<td>Literacy rate, males (%)</td>
<td>28</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Literacy rate, females (%)</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Dependency ratio&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1051</td>
<td>1021</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>In a census of this nature, it is not possible to distinguish true fetal deaths from deaths very soon after birth. Persons were asked specifically whether the infant was dead at the time of expulsion or extraction. The fetal death ratio is defined as fetal deaths divided by live births (× 1000).

<sup>b</sup>The total fertility rate is the hypothetical number of children born to a woman in her lifetime at the current age-specific birthrates.

<sup>c</sup>Number of persons < 15 and > 64 for every 1000 persons aged 15–64.

control villages. Since this could have been primarily due to changes in infant mortality, the death rate for those over 1 year of age was also calculated. The resulting death rate was eight per 1000 in VHW villages, compared to 13 per 1000 in controls, still a large reduction.

The fetal death ratio — number of infants born dead divided by the total of live births — provides some estimate of the ability of the VHW to prevent fetal deaths. The fetal death ratio in the auxiliary villages was about half that of the control villages. The VHW takes no part in actual births, but does refer to the health corps station difficult labor and all problem pregnancies, and cases in which delivery has not occurred 2 or 3 hours after the rupture of the membrane. It seems likely that the reduction in fetal deaths has come through the simple device of having someone in the village who knows when a doctor should be consulted.

The VHW also acts as a family planning educator and provides oral contraceptives to the women of his village. Thus, his presence carries the potential for a significant reduction in fertility. The census results indicate that the total fertility rate (expected number of live births in a woman's lifetime at the current age-specific birthrates) was somewhat lower in the VHW villages: 6.41 live births compared to the 6.96 for controls. The crude birthrate for auxiliary villages was 40.2 per 1000 persons compared to 44.9 per 1000 in the control villages. This difference was not, however, statistically significant, and it cannot be concluded from the amount of information now available that fertility is indeed lower in the auxiliary villages than in the control villages.

The rates from the present census do not represent the VHWs' potential for lowering birth and fertility rates. The census was conducted 15 months after the VHWs' introduction, and most births in the first 9 months after their arrival represent conceptions that occurred before they came. Hence, the VHWs had had only a 6-month period to affect birthrates at the time of the census, as opposed to the entire 15 months in which they could affect death rates.