

From Grassroots to Global Goals: Evaluating the Impact of Lady Health Workers on Maternal and Child Health in Resource-Limited Settings in Pakistan.

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Abstract

Maternal and child health is a key priority in low-resource settings and an integral part of the Sustainable Development Goals (SDGs). However, even after the MDG era, several developing countries still have high rates of infant mortality, limited access to primary health care services, and high out-of-pocket health expenditure. Community Health Worker (CHW) programs, in this context, have proven to be useful ways to reach underserved populations for preventive and primary care. The study evaluates the effect of the Lady Health Worker (LHW) programme, as part of the IRMNCH & Nutrition, on the maternal and child health outcomes of rural Dera Ghazi Khan. Primary survey data were used in both program and non-program areas to analyze prenatal and postnatal care, breastfeeding, vaccination coverage, birth spacing, and infant mortality. The findings show that the LHW programme leads to a significant increase in service utilisation, better preventive healthcare practices, and, to some extent, a reduction in infant mortality. In addition to these empirical findings, the study positions the

programme in a broader development context, identifying links between health outcomes and socioeconomic dimensions like livelihoods, access to energy, financial inclusion, etc. They are not measured directly, but they help to make sense of how the community health interventions can improve health and economic resilience. The study concludes that the LHW programme is an inexpensive intervention that promotes progress towards maternal and child health-related SDGs and should be scaled up in similar low-resource settings.

Author Details

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Introduction

Background

Community health, which is largely the result of environmental health, is among the most important determinants of human development, especially in low- and middle-income countries (LMICs) where health systems lack sufficient resources, are poorly integrated, and are heavily reliant on household out-of-pocket (OOP) payments. The World Health Organization estimates that over 930 million people worldwide are spending over 10% of their household budgets on health, and that almost 100 million people fall into very poor conditions every year due to health expenditure. Preventive and community-based approaches to providing health services are thus important not just in terms of safeguarding health, but also in lowering economic vulnerability in this context. Pakistan is a good example in this context. The country's health system inequities, resource limitations, and high infant and maternal mortality rates have been longstanding issues in the country with a population of over 240 million people (World Bank, 2023).

The government responded with the Lady Health Workers (LHW) Program in 1994, which is part of its larger efforts to provide primary healthcare and is in line with the Alma-Ata Declaration of 1978. Under the subsequent evolution of the programme under IRMNCH, the female Lady Health Workers are mobilized to engage in preventive and basic curative services, namely maternal and child health, vaccination, family planning, and health education (Hafeez et al., 2011). In 2023, the LHW program was one of the largest community health worker (CHW) programmes in the world, serving a catchment of almost 60% of the population, especially rural areas with a lack of health services. The relevance of Pakistan's LHW program to the world is that it is aligned with Sustainable Development Goals (SDGs). LHWs have a direct impact on SDG 3 (Good Health and Wellbeing) by enhancing maternal, neonatal, and child health, and an indirect impact on SDG 1 (No Poverty), SDG 2 (Zero Hunger), and SDG 5 (Gender Equality) through the improvement of household wellbeing and the empowerment of women and poverty reduction.

There is also comparative evidence from Africa, South Asia, and Latin America that CHWs can make a critical difference in the quest for universal health coverage (UHC) and mitigating health inequities in low-resource settings, as detailed below (Andom et al., 2025; Zulu et al., 2024). The economic costs of health interventions should not be neglected at the same time. In developing countries, rural households are exposed to multiple vulnerabilities, including food insecurity, limited or absent access to financial services, and income instability. These are further compounded by poor health, which reduces productivity and raises health expenditures, which can push households into poverty (Kutzin et al., 2021). Therefore, initiatives such as LHWs should be seen as more than a health delivery programme, but as part of the wider socioeconomic development. There is literature on microfinance (Raheem et al., 2020), income diversification (Sakhani et al., 2025), and energy access (Iqbal et al., 2021), which indicates that those households that have stronger economic foundations are more likely to access preventive healthcare services.

The present study is set in one of the most underserved areas of Pakistan, which has a high infant mortality rate and low literacy rate in the district of Dera Ghazi Khan of Punjab, with a high incidence of poverty. The district offers a good microcosm to evaluate the impact of the LHW program since not all areas of the district are covered, and it provides a quasi-experimental setting for comparison. This study uses both mean difference tests and propensity score matching (PSM) to determine if there is a difference in health outcomes between households in program and non-program areas.

1.2 Research Objectives

Formulated on the gaps, the present study pursues four interrelated objectives:

To analyse the difference in health outcomes, including prenatal care, postnatal care, breastfeeding, vaccination, birth spacing, and infant mortality between program and non-program areas in District Dera Ghazi Khan.

To test the robustness of results by applying propensity score matching (PSM) to control for confounding factors such as socioeconomic status.

To conceptually link health outcomes with economic drivers including out-of-pocket expenditures, rural livelihoods, and microcredit

To provide policy recommendations for strengthening community health worker programs in Pakistan with specific attention to their role in advancing the SDGs.

Problem Statement

Despite nearly three decades of implementation, Pakistan continues to face significant maternal and child health challenges. The infant mortality rate is still high at 55 per 1,000 live births, and the maternal mortality rate is estimated at 186 per 100,000 live births, which is higher than regional comparator countries like Bangladesh and Sri Lanka (World Bank, 2023). Moreover, more than 60% of healthcare funding comes from out-of-pocket (OOP) payments, which disproportionately affect poor and rural households (WHO, 2022). The enduring structural deficits highlight the need to examine the effectiveness of community-based health interventions and to evaluate their impact on population health outcomes. While a few studies have reported that the Lady Health Worker (LHW) Programme has contributed to improved coverage of vaccinations, contraceptive use, and antenatal care attendance (Hafeez et al., 2011; Janjua et al., 2014), there are concerns about its wider and longer-term effects on reduced mortality and strengthening the health system. Moreover, there is very little evidence of the effectiveness of these improvements in terms of a reduction in health inequities, especially in the underserved rural districts. Dera Ghazi Khan is an example of a relevant community because of its high poverty rate, low literacy rate, poor health infrastructure, and its dependence on agriculture and livestock. The district typology is similar to that of many rural areas of Pakistan and is a suitable setting for an appraisal of the effectiveness of the LHW Programme in practice.

Literature Review

Lady Health Workers and Health Outcomes

Community Health Workers (CHWs) and Lady Health Workers (LHWs) are well known to be an integral part of the strengthening of primary healthcare in low and middle-income countries (LMICs). They are the main providers of preventive, promotive, and basic curative services to people with geographic, financial, and sociocultural barriers to formal health services. There is systematic evidence that CHW programs have a positive impact on maternal and child health outcomes by increasing immunization coverage, breastfeeding, appropriate birth spacing, and utilization of antenatal and postnatal care services (Gogia et al., 2021). Similarly, Accredited Social Health Activists (ASHAs) have played a pivotal role in increasing maternal and neonatal health services in India, but there remain several barriers, including low pay and training limitations (Tahir et al., 2025). According to Hafeez et al. (2011), the LHW Programme has yielded mixed results in Pakistan, especially in terms of the uptake of contraceptive and immunization coverage. Likewise, Janjua et al. (2014) reported that LHWs decrease access barriers to ANC and increase the referral linkages, but they were unable to achieve significant reductions in infant mortality. Weak supply chains, supervision, and career advancement continue to negatively impact program effectiveness, as evidenced in recent evidence. Overall, the contribution of LHWs to reducing mortality and to the overall health system transformation needs to be further explored and validated in practice.

Economic and Developmental Dimensions

While the health impacts of CHW programs are well established, the economic implications of CHW programs have been less explored. Access to health services is largely out-of-pocket financing in Pakistan, with over 60% of total health expenditure coming from such sources, exposing households, especially the poor, to catastrophic health expenditures (CCHEs) (World Bank, 2023; WHO, 2022). These financial risks can be reduced through preventive interventions, including LHW services, which are expected to prevent the progression of disease and lower the number of costly hospitalizations (Kutzin et al., 2021). Empirical support for this level of financial security in Pakistan, however, is still scarce. Health and livelihoods are interlinked at the household level. Smallholder agriculture is very vulnerable to low productivity, climate shocks, and poverty and is the backbone of the rural economies, especially in Punjab (Sakhani, Jabbar, & Bhatti, 2020). Insufficient health decreases workers' productivity, and financial constraints prevent people from getting health care, creating another cycle of poverty and poor health. CHW programs are conceptually placed to break this vicious circle by enhancing health outcomes and increasing economic participation; however, the empirical evidence linking CHW programs with these outcomes is limited in Pakistan.

Economic and SDG Linkages: Theoretical Perspectives

Theoretical perspectives on Economic and SDG Linkages are discussed in this section. This study is based on the theoretical principles of the interrelationship between health, economic wellbeing, and sustainable development. The LHW Programme has direct impacts on SDG 3 (Good health and wellbeing) and indirect impacts on SDG 1 (No poverty) by decreasing health-related income shocks, SDG 2 (Zero hunger) by improving maternal and child nutrition, and SDG 5 (Gender equality) by improving women's health and empowerment (Kiendr  b  go et al., 2024). Even then, empirical studies in Pakistan do not usually take a multi-SDG perspective on the LHW Programme. Most studies examine the health service delivery outcomes, and its developmental contribution is under-theorized. To place Pakistan's LHW Programme in the context of global development and enhance its policy relevance in the framework of integrated health and development planning, this gap needs to be addressed.

Methods and Procedure

Analytical Framework

Keeping in view the objectives of this research, a two-step methodology was adopted: Comparisons of health outcomes between program areas (areas covered by the Lady Health Workers (LHWs)) and non-program areas (areas not covered). Checking for the robustness of results by controlling for confounding factors that could affect the comparison. A mean difference test (t-test) was performed in the first step, and a Propensity Score Matching (PSM) method was performed in the second step. These are complementary: When used together, the t-test gives a preliminary indication of the differences between outcomes, while PSM enhances the causal interpretation of the t-test results by allowing for the comparison of similar households in both groups.

Mean Difference Test

The one-on-one comparison of variables' means within the two selected groups is common, and along with this comparison, the t-test is deployed to calculate the variables' significance. t-stats are computed using the following equation: $t = (\mu_1 - \mu_2) / \sqrt{(\sigma_1^2 / N_1 + \sigma_2^2 / N_2)}$ Where μ_1 , σ_1 , and N_1 are the mean, population variance, and sample size of the treatment group (program area), and the

non-program area μ_2 , σ_2 , and N_2 are the mean, population variance, and sample size, respectively. The difference will be significant if $|t| > 2$.

Propensity Score Matching Propensity

Score Matching (PSM) is a technique that is applied in observational studies to reduce the impact of these confounding factors and to improve the impact estimates. PSM does not make a comparison between program and non-program households, but rather only between similar households. For this research, income was determined as the primary confounder. Thus, homes in program and non-program areas were paired within similar income categories (low, middle, and high) for a fair comparison. This method allows isolating the impact of the Lady Health Worker (LHW) Programme on health outcomes, free from the influence of income differences. Matching was performed using the nearest neighbour method with replacement, and balance checks were used to ensure the groups were balanced. This enabled an accurate measurement of the effect of the programme on maternal and child health outcomes.

Data Collection

Universe of the Study

The universe of the study was the population of Dera Ghazi Khan District.

Sample Design & Size

Program and non-Program populations can be compared naturally, as the IRMNCH/LHW programme is partially implemented in the surrounding districts of Dera Ghazi Khan and Taunsa Sharif, with some parts of rural areas yet to be covered. A total sample of 400 married women, 200 from program areas and 200 from non-program areas, were selected. The eligibility criteria were being married for at least five years or having at least two children. A multi-stage random sampling technique was used. Four union councils were randomly picked (two from each tehsil), and within each union council, 50 women were picked from both program and non-program areas. Information was gathered using a pre-tested structured questionnaire, adapted from the DCPHC model questionnaire (Bangladesh) and the Pakistan Demographic and Health Survey (PDHS 2006–07). The study focused on some of the most important maternal and child health indicators such as antenatal and postnatal care, vaccination, breastfeeding behaviour, infant mortality, and birth spacing.

Research Instruments

In order to make the variables local, a group discussion was held with practitioners such as a gynaecologist, child specialist, Lady Health Supervisor, and former coordinator of the LHW program, using the identified variables from the literature. A pilot survey was carried out for validation, and adjustments were made as needed. Four trained female enumerators, who have experience conducting USAID and WHO surveys, administered the survey. A special training session was conducted so participants could get to know the questionnaire. Interviews were conducted in Saraiki as well as other local languages, as necessary. The researcher performed the fieldwork supervisionally.

Ethical Considerations

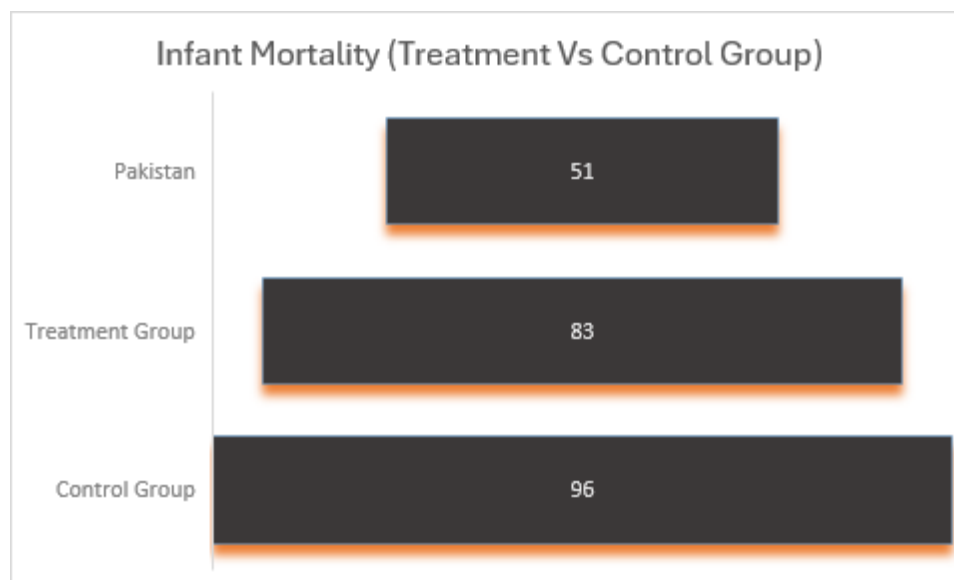
In terms of ethical responsibility, participants and respondents were taken voluntarily, and informed consent was gained. Confidentiality and privacy were ensured. The study was conducted in an ethical manner within the guidelines of community-based health research.

Results and Discussion

LHWs Program's Impact on Infant Mortality

Data were collected and analysed from both the control and the treatment groups with respect to infant mortality. The graphical snapshot of the figure is given:

Figure 1: Infant Mortality



Sources: Statistical Bureau of Pakistan (2023); Field survey conducted by the researcher of this study.

Infant mortality rates are still higher in rural areas than in urban areas across the country as a whole. This reflection is also present in both districts, Dera Ghazi Khan & Taunsa Sharif. But also, there is a difference in the LHW program's areas non program areas, which is reflected in Figure 1. Furthermore, we are also interested in finding out what inputs of the LHW program are important to reduce mortality. The LHW Program has demonstrated positive impacts on the following common health indicators. The table below summarizes key indicators associated with common health indicators that are input variables of the LHW program.

Impact of LHW Program on Common Health Indicators

The table below summarizes key indicators associated with common health indicators that are input variables of the LHW program.

Table 1: Mean (t-stat) of Input Variables

Variable	Program area	Non-program area	t-stat
Health Education (Hand wash after using toilet)	0.66 (0.034)	0.42 (0.035)	4.91
Family Planning (% adoption of Family Planning method)	0.52 (0.0305)	0.27 (0.031)	5.24

(Standard error of mean is shown in parentheses)

We calculate the mean of health education in the program and non-program areas. Health education has a factor of 'hand wash after toilet'. The mean score for health education is higher in the program area than the mean for the non-program area (see above table). Applying a t-test for the significance of the mean difference indicates that the difference is statistically significant. The program area has a greater amount of health education than the non-program area. Health education sessions are

conducted in the program area to improve mothers' awareness of health. Like the above table, the mean of the family planning (FP) adoption rate for the program area is greater than that of the non-program area. The t-statistic calculated is 5.24, showing that the difference is statistically significant. Indicates effectiveness of the program in terms of family planning. The uptake of family planning was higher in program areas than in non-program areas.

Impact of LHW Program on Specific Health-related Factors

Health-related variables are compared for program area and non-program area. As a first step, means of the factor 'frequency of check-ups' in prenatal care for the two areas of care are computed. The means are shown in Table 2. The mean (t-stat) of Intermediate Variables is shown in Table 2. Table 2 displays the mean (t-stat) of Intermediate Variables. Time period (ds) Place (par) Non-place (np) Time (t-stat)
The means are shown in Table 2:

Table 2: Mean (t-stat) of Intermediate Variables

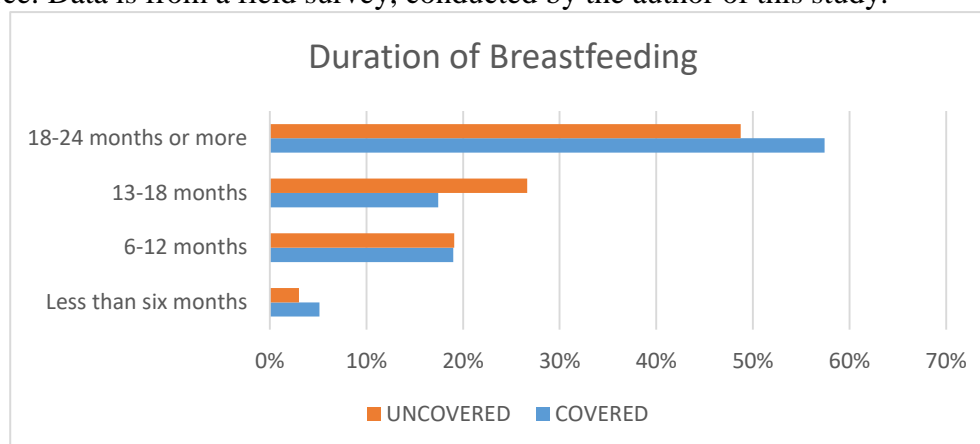
Variable	Program area	Non-program area	t-stat
Prenatal care (Frequency of check-ups)	2.68 (1.412)	1.87 (1.494)	5.53
Postnatal care (% of women having check-ups after delivery)	42 (3.15)	27 (3.12)	3.16
Vaccination (% of children received vaccination)	95 (1.5)	69 (3.26)	7.18

(Standard error for mean in parenthesis)

Results showed that the Lady Health Worker (LHW) Programme has a positive and significant effect on uptake of maternal and child health services. The ability of LHWs to promote the use of antenatal services is evident as the utilization of the service is higher in program areas compared to non-program areas, with a t-value of 5.53, which is statistically significant. Likewise, the rate of postnatal care coverage is higher in program areas (42%) than in non-program areas (27%), with a significant t-value of 3.16. This indicates a positive promotion of postnatal health-seeking behavior among mothers by LHWs. The immunization rates of children also reveal a statistically significant improvement in program areas, reflecting higher levels of immunization coverage in areas where the LHW Programme is in effect. Last but not least, breastfeeding duration is taken as an added parameter to monitor child and mothers' health practices within the programme, further supporting the assessment of its impact regarding early childhood nutrition and care. The overall comparison of means indicates that the LHW Programme has a significant impact on prenatal care, postnatal care, and immunization practices in areas relative to those not in the Programme. The difference in 'duration of breastfeeding' for both program and non-program areas is shown in Figure 2 below:

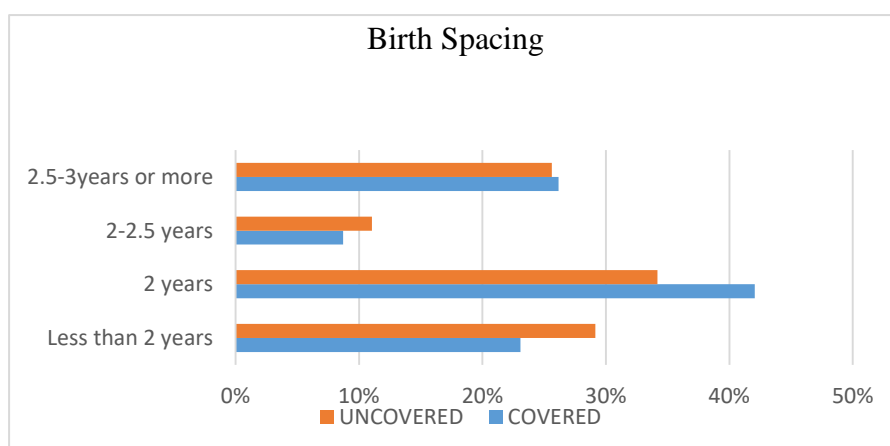
Figure 2: Duration of Breastfeeding

Source: Data is from a field survey, conducted by the author of this study.



Data is from a field survey, conducted by the author of this study. It is apparent from Figure 2 that more mothers in the program area reported breastfeeding for the longest period of 18-24 months or longer when compared to the non-program area. This implies that the role of the health education program in the longer duration of breastfeeding in both areas cannot be neglected. We measured the years of birth spacing between the last two children in both the program area and the non-program area. The difference in birth spacing for the program and non-program areas is shown in the figure below:

Figure 3: Birth Spacing (Source: Field survey by the author of this study)



The birth spacing of 2 years is more common in both program and non-program areas, but there is a significant difference between the two. The two-year spacing rate is higher in program areas than the shorter spacing of births in non-program areas. There is little variation at the high end of birth spacing; this is the same for both groups. In general, the results show that there are some differences in family planning between the program and non-program areas. The results of the t-test also show significant differences in the major maternal and child health outcomes. Mothers in the areas covered by LHWs consume more prenatal and postnatal care, have higher rates of child vaccination, and more consistent exclusive breastfeeding. Program areas also have significantly higher rates of birth spacing and uptake of family planning. Improvements in service uptake have been greater than the absolute decrease in infant mortality rates in program areas. In summary, the results support the hypothesis that the Lady Health Worker Programme has a positive impact on maternal and child health indicators. The differences, however, in socioeconomic characteristics between program and non-program areas suggest the need for robustness checks to verify these effects.

Propensity Score Matching (PSM) Results

Table 3: Propensity Score Analysis of Infant Mortality

Scale	Program area	Non-program area	Overall
Low Income	7.1%	22.2%	17.6%
Middle Income	9.8%	11.4%	10.5%
High Income	0%	6.5%	4.2%

Table 3 compares infant mortality rates between program and non-program areas via propensity score matching (PSM). Income is the most important factor controlling for confounding factors because the method compares households with similar socioeconomic characteristics. The sample was categorized into three income groups (low, middle, and high) to ensure comparisons within similar economic groups. The results demonstrate a clear negative relationship between infant mortality and income, with rates of 17% and 4%, respectively. Infant mortality is always decreased in program areas for all income groups. For instance, the death rate in low-income families in program areas is 7% versus 22% in non-program areas, suggesting that the program has an important impact in disadvantaged families. Matching on income, education level, household size, and the presence of health facilities in the households, the results are still significant. Program areas are showing significant improvement in prenatal and postnatal care, vaccination coverage, and birth spacing. Reductions in the infant mortality rate are, however, not as strong, indicating that infant mortality rates also rely on other health system factors like facility-based and emergency obstetric care. The PSM analysis overall indicates that the effects observed are not explained by socioeconomic differences, but rather by actual improvements in preventive and promotive health outcomes because of the Lady Health Worker Programme.

Discussion

The findings of this study are consistent with previous research highlighting the important role of Community Health Workers (CHWs) in improving maternal and child health outcomes in Pakistan and South Asia (Hafeez et al., 2011; Tahir et al., 2025). The major gains in vaccination coverage and uptake of family planning services reflect that the Lady Health Worker Programme (LHW) is an effective public health intervention and is functioning as a key contributor to SDG 3 (Good Health and Well-Being). While not a huge difference, a small decrease in infant mortality indicates that community health care services can make a difference in child survival rates, though better results would be seen with stronger referral systems and quality facility-based care. While no measures were taken of out-of-pocket health expenditure, there is evidence that preventive programs like the LHW initiative can save on health expenditure because of prevention and access to care in a timely manner (Kutzin et al., 2021; WHO, 2022). This means that it is likely to contribute to Universal Health Coverage (SDG 3.8). In addition to health benefits, the results extend implications for the economy and society. Better maternal and child health improves household productivity, decreases treatment costs, and helps to alleviate poverty and food insecurity (Sakhani et al., 2020). The literature also indicates that health interventions will be more successful if they are implemented along with financial inclusion interventions because families with more economic resources will be able to adopt recommended health practices better (Raheem et al., 2020; Sakhani et al., 2025). Likewise, complementary measures like clean energy and better sanitation can support health improvement and improve community resilience (Iqbal et al., 2021). The LHW Programme is also helping to achieve SDG 5 (Gender Equality) by providing job opportunities for women and enhancing their status in society. The role of female health workers is crucial for addressing cultural challenges that hinder access to health care services, especially in rural areas with conservative cultural attitudes. (Owoputi et al., 2024) Overall, the results indicate that the LHW

Programme has a significant positive impact on the health of mothers and children in the target communities. The programme has direct impacts on health, as well as financial protection, women's empowerment, and sustainable development. The relatively low reduction in infant mortality shows, however, that there is a need for improving the integration of community-based services with health services and with broader social development measures.

Conclusion

This study assessed the impact of Pakistan's Lady Health Worker (LHW) Programme on maternal and child health outcomes in District Dera Ghazi Khan using mean difference tests and propensity score matching (PSM). The results show that the programme has contributed to an increased use of prenatal and postnatal care services, vaccination coverage, breastfeeding practices, and birth spacing among the beneficiaries' households. The findings validate the success of community-based health programs in improving access to basic health care in poor settings. The overall evidence suggests that the LHW Programme plays an important role in improving maternal and child health outcomes, although this only results in a modest overall reduction in infant mortality. The programme has indirect development impacts beyond health, including gender equality, strengthening household resilience and progress towards Sustainable Development Goals (SDGs), specifically SDG 3 (Good Health and Well-Being), SDG 1 (No poverty), SDG 2 (Zero hunger) and SDG 5 (Gender equality). However, the overall findings show that community health worker programmes are important and need to be continued and scaled up in Pakistan and other LMICs, with greater linkages to higher quality facility-based health services to improve health and development in rural areas.

Policy Recommendations

1. Improve the linkages between Lady Health Workers (LHWs), health facilities, and emergency transport services to strengthen referral systems and improve maternal and child survival outcomes.
2. Extend the geographical reach of the LHW programme, especially in remote, tribal, and underserved rural areas, to decrease health disparities and enhance equitable access to health care services.
3. Support preventive health care services and complement with financial protection measures to limit out-of-pocket payments and payments that could cause catastrophic health costs for vulnerable households.
4. Enhance the quality of services provided to families by LHWs, data management, and real-time decision-making through ongoing training and supervision, and digital health tools.
5. Encourage integrated development strategies that combine health interventions, microfinance services, and livelihood and clean energy programs to ensure resilience and wellbeing of households.
6. Improve women's empowerment through equitable wages, promotion and inclusion of women health workers in community and health sector decision-making.
7. Integrate the LHW Programme into the SDG monitoring mechanism in Pakistan and create a regular evaluation system to monitor and evaluate its role in improving health outcomes, reducing poverty, advancing gender equality and financial protection, to incentivize continued investments by the government and donors.

References:

- Ahmad, R., Haq, M. A. U., & Mehmood, I. (2025). Assessing Infrastructure-Led Recovery of Resilient Housing Development in the Model Village of the HHRD, Chak Patiyat, Rajanpur. *Journal for Current Sign*, 3 (3), 578-595.

- Andom, A. A., Tesfay, F. H., & Gebre, G. G. (2025). Community health workers and universal health coverage in low-resource settings: Evidence from Africa and South Asia. *Global Health Research and Policy*, *10*(1), 1–15.
- Bechange, S., Schmidt, E., Ruddock, A., Khan, I. K., Gillani, M., Roca, A., Nazir, I., Iqbal, R., Buttan, S., Bilal, M., & Ahmed, L. (2021). Understanding the role of lady health workers in improving access to eye health services in rural Pakistan: Findings from a qualitative study. *Archives of Public Health*, *79*(20).
- Hafeez, A., Mohamud, B. K., Sheikh, M. R., Shah, S. A. I., & Jooma, R. (2011). Lady health workers programme in Pakistan: Challenges, achievements and the way forward. *Journal of the Pakistan Medical Association*, *61*(3), 210–215.
- Haq, M. A. U., & Khan, H. (2025). Exploring the Role of Parental Barriers in Hindering Inclusive Education in South Punjab, Pakistan. *ACADEMIA International Journal for Social Sciences*, *4*(2), 2269–2277.
- Haq, M. A. U., & Rafiq, N. (2025). Analysis of the institutional barriers to inclusive education for diverse student needs in Pakistan. *The Critical Review of Social Sciences Studies*, *3*(2), 372–382.
- Iqbal, M., Khan, M. A., Abbas, F., & Ahmad, M. (2021). Household biogas technology adoption and its impact on rural livelihoods and environmental sustainability in Pakistan. *Renewable Energy*, *172*, 1182–1193.
- Janjua, N. Z., Mahmood, B., Bhatti, J. A., & Ali, S. (2014). Determinants of maternal health service utilization in Pakistan: The role of Lady Health Workers. *BMC Pregnancy and Childbirth*.
- Kiendrébéogo, J. A., Souares, A., et al. (2024). Community health workers and Sustainable Development Goals: Evidence from low-income countries. *Global Health Action*.
- Kutzin, J., Yip, W., & Cashin, C. (2021). Alternative financing strategies for universal health coverage. *World Scientific Handbook of Global Health Economics and Public Policy*, *1*, 267–309.
- Owoputi, A., Yusuf, O., Adebayo, A., & Okafor, C. (2024). Community health workers and women's healthcare access in rural communities: A systematic review. *BMC Health Services Research*, *24*(1), 112–128.
- Raheem, A. R., Baloch, M. A., & Khan, S. U. (2020). Microfinance and household resilience: Evidence from rural Pakistan. *Pakistan Journal of Social Sciences*, *40*(2), 675–689.
- Sakhani, A. K., Ahmed, S., Jabbar, A., & Bhatti, M. A. (2025). Financial inclusion and household resilience in rural South Asia: Implications for sustainable development. *International Journal of Social Economics*, *52*(1), 44–61.
- Tahir, M., Ali, S., Khan, R., & Hussain, N. (2025). Community health worker interventions and maternal-child health outcomes in South Asia: A systematic review and meta-analysis. *Global Public Health*, *20*(2), 145–162.
- Tahir, M., Ali, S., Khan, R., & Hussain, N. (2025). Community health worker interventions and maternal-child health outcomes in South Asia: A systematic review and meta-analysis. *Global Public Health*, *20*(2), 145–162.
- World Bank. (2023). *Pakistan health and nutrition overview*.
- World Health Organization. (2022). *World health statistics 2022: Monitoring health for the SDGs, sustainable development goals*. World Health Organization.
- World Health Organization. (2022). *World health statistics 2022: Monitoring health for the Sustainable Development Goals*.
- Zulu, E. M., Perry, H., & Jacobs, C. (2024). Community health workers and primary healthcare strengthening in low- and middle-income countries: A global review. *The Lancet Global Health*, *12*(3), e345–e356.
- Zulu, J. M., Kinsman, J., Michelo, C., & Hurtig, A. K. (2014). Integrating national community-based health worker programmes into health systems in low- and middle-income countries. *BMC Public Health*, *14*, 987.