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Financial Incentives and Reproductive Health Behaviour: Evaluating the Impact of a BISP-Linked E-Voucher Program on Family Planning Uptake in South Punjab, Pakistan

Imran Ahmed
MS Scholar, Superior University Lahore, Pakistan
imran.rtp1@gmail.com
Sohail Anwar
Program Leader/Lecturer, Superior University Lahore, Pakistan
sohail.a.03@superior.edu.pk
An ul Abdin
Chairman, NIGS, Lahore, Pakistan
jeeaqeel@gmail.com,
Wajahat Yaqub
PhD Scholar, Riphah International University Lahore
asher_wajahat88@hotmail.com

ABSTRACT

Purpose: *This study evaluates the effectiveness of the delivery of a family planning E-Voucher program as part of the largest social protection program in Pakistan, the Benazir Income Support Program (BISP), in increasing access to reproductive health services among poor populations. The objective of the research is to solve the problem of whether voucher utilization contributes towards family planning adoption among BISP beneficiary women in District Dera Ghazi Khan, and to find out the real contribution of behaviour and socio-culture in the reproductive health decision.*

Design/Methodology/Approach: *A cross-sectional quantitative survey was conducted amongst 528 married reproductive age women registered as BISP beneficiaries. Data was collected with a structured questionnaire of the socio-demographic characteristics, voucher awareness and utilization, reproductive health knowledge, and contraceptive adoption behaviour. The techniques of descriptive statistics, logistic regression, mediation analysis, moderation analysis, and subgroup robustness tests were used to analyse how voucher utilization and family planning uptake are related.*

Findings: *The results show that there is a significant association between the utilization of E-Voucher and the adoption of family planning ($p<0.01$), with a beta value of -0.600. However, the explanatory power of the regression models is small (Pseudo-R2c ~ 0.012), suggesting financial incentives alone are not enough to explain reproductive health behaviour. Mediation analysis shows that knowledge improvement and voucher process awareness do not significantly transmit the effect of voucher utilization on contraceptive adoption, whereas in moderation analysis, cultural norms, household decision-making authority, and mobility constraints do not significantly modify the effect of voucher*

utilization on uptake. Subgroup analysis shows stronger effects of the voucher on female tribal and economically marginalized people.

Implications/Originality/Value: *The results indicate that demand-side financing interventions can bring improvements in access to reproductive health services, but that these interventions need to be combined with broader behavioural interventions and health system improvement if long-term reproductive health outcomes are to be achieved.*

Keywords*: Family Planning Uptake; Demand-Side Financing; Health Voucher Programs; Benazir Income Support Program (BISP); Reproductive Health in Pakistan.*

1 Introduction

Access to reproductive health services and family planning services is an integral and fundamental component of public health systems across the world. Despite significant advances in the improvement of maternal health outcomes worldwide, many of the low- and middle-income countries (LMICs) have large gaps in access to reproductive health (Wang et al., 2026). Women from lower-income groups and particularly those who live in rural and marginalised communities are often subject to barriers that limit access to contraceptive services and/or reproductive health counselling. These barriers include sociological problems such as finances, lack of healthcare set-up, cultural restrictions, and gender associated power imbalance within the households (Pagoni et al., 2026).

Pakistan is a specifically complicated case in this larger global context. Although the country has made progress in the expansion of primary healthcare services and the implementation of population management strategies, as well as progress in reducing disparities in access to sexual and reproductive health services between urban and rural areas, and in achieving balanced gender ratios at the primary healthcare level, there are still significant regional disparities in reproductive health outcomes (Zang et al., 2025). One of the most underserved parts of Pakistan is the South Punjabi district of Dera Ghazi Khan. The district is characterised by high levels of poverty, poor access to healthcare facilities, as well as deeply-rooted socio-cultural norms that govern reproductive decision-making. Women in this region often suffer from limited mobility, limited access to reproductive health information, and limited autonomy in the household decision-making processes. These circumstances are contributing to high and sustained fertility rates and high rates of unmet need for family planning services (Vey et al., 2025). Recognizing the need to address economic barriers faced by marginalised households, in 2008, the Government of Pakistan set up the Benazir Income Support Program (BISP). BISP is the largest social protection scheme in the country, providing unconditional cash transfers to poor women. The program was based on poverty and household economic security reduction above all (Tenenbaum et al., 2025). However, directly providing financial resources to women can also have the potential to impact the decision-making dynamics within households as well as women's access to essential services, including healthcare. BISP can. Over the years, different forms of policymakers have been seeking out more avenues for introducing social protection programs alongside health interventions. One such innovation is the introduction of a demand-side financing (DSF) mechanism, like the health voucher programs. These are designed to mitigate the financial barriers faced by beneficiaries of healthcare, including subsidies that are provided in a targeted manner to access specific health services from health and healthcare providers that have been accredited by the relevant authorities (Sideris et al., 2025).

Despite the policy relevance of such interventions, there is scant empirical evidence as to their effectiveness. While direct costs of services may be reduced through financial incentives, reproductive health behaviour is influenced by a much larger number of structural and cultural factors. In many conservative communities, the ability of women to access healthcare services is also determined by social mores, regimes of domestic authority, and constraints on women's mobility (Rodin et al., 2025). As a result, it may not be sufficient to address financial barriers to lead to meaningful behavioural change. Existing studies on social protection programs have primarily focused on the poverty reduction, household consumption, and education outcomes of social protection programs (Prayitno et al., 2025). Similarly, there has been a tendency to focus on the strengthening of supply-side healthcare infrastructures as part of reproductive health interventions. Relatively few studies have considered the interaction between social protection mechanisms and demand-side health financing tools, let alone in conservative rural settings (Rafi et al., 2025).

Furthermore, most evaluations of voucher-based reproductive health programs that do exist to date are based on aggregate national or provincial information, which potentially hides key local differences in the effectiveness of programs. District-based evidence is particularly missing from poor areas such as Dera Ghazi Khan, where socio-cultural conditions may have a strong effect on the programs (Ozkan, 2025). This study aims to fill these gaps by assessing the effect of the BISP-linked E-Voucher program on the uptake of family planning services among low-income women living in District Dera Ghazi Khan. Using primary survey data collected from 528 BISP beneficiary women, the research examines whether the use of the vouchers is contributing to the growth of family planning services adoption, as well as the behavioural and contextual factors during reproductive health decisions (Okesanya et al., 2025).

2 Literature Review

2.1 Social Protection and Health Outcomes

Social protection programs have become an important policy tool for poverty and vulnerability alleviation in developing countries (Haxhija et al., 2025). These programs typically include cash transfers, social assistance schemes, and targeted subsidies to improve the welfare of households and access to basic services. A growing body of research indicates that social protection programs can affect health outcomes in several different ways (Katiforis et al., 2025). There has been some evidence from a few LMICs that shows that cash transfer programs can increase healthcare utilization and improve maternal and child health outcomes. Conditional cash transfer programmes conducted in countries such as Mexico and Brazil have demonstrated large increases in prenatal care attendance, child immunisation rates and utilisation of health. Even unconditional cash transfers have been associated with improvements in nutrition and an increase in access to healthcare services (Hamashima et al., 2025).

In Pakistan, one of the largest social protection initiatives in South Asia is the Benazir Income Support Program (BISP). The program does provide financial assistance to economically poor households, and women are designated as key beneficiaries in terms of cash transfers. By sending payments to women, BISP is aiming to build the financial autonomy of women and increase women's influence in decision-making within the household (Geddes et al., 2025). Although the goal of BISP was to be a poverty alleviation program, policymakers have come to see the potential for these programs as a platform for the delivery of other complementary social services. Integrating health interventions within social protection systems may increase efficiency and coverage of public health interventions (Engelke et al., 2025).

2.2 Demand-Side Financing and Health Vouchers Programs

Demand-side financing interventions are based on sound relations on the demand side of healthcare by reducing the financial barriers that individuals face. Unlike supply-side interventions, which were designed to expand the infrastructure of the healthcare system, DSF mechanisms concentrate on the economic constraints of people in accessing the healthcare service. Health voucher programs are one of the most common types of DSF strategies (Eelager et al., 2025). These programs provide beneficiaries with vouchers that they can trade for specific health services covered in accredited health services. By covering the cost of healthcare, healthcare vouchers encourage people to access important health services that they would otherwise not be able to afford (Chauke, 2025).

Empirical evidence from countries including Bangladesh, Kenya and Cambodia has indicated that voucher programs can increase use of maternal healthcare and adoption of family planning. In Bangladesh, a link between voucher schemes and an increase in the use of antenatal care services and facility-based deliveries. Similarly, research by work in Kenya has found that reproductive health voucher programs have helped to increase the use of contraceptive methods among poor women (Ayuba et al., 2025). However, much depends on the contextual factors while measuring the effectiveness of the voucher programs. Research suggests that not only is financial incentive the key to the success of the programs, but also the quality of the services, accessibility of healthcare services, and social acceptance of the targeted health services (Anumudu et al., 2025).

2.3 Socio-Cultural Barriers to Reproductive Health Access

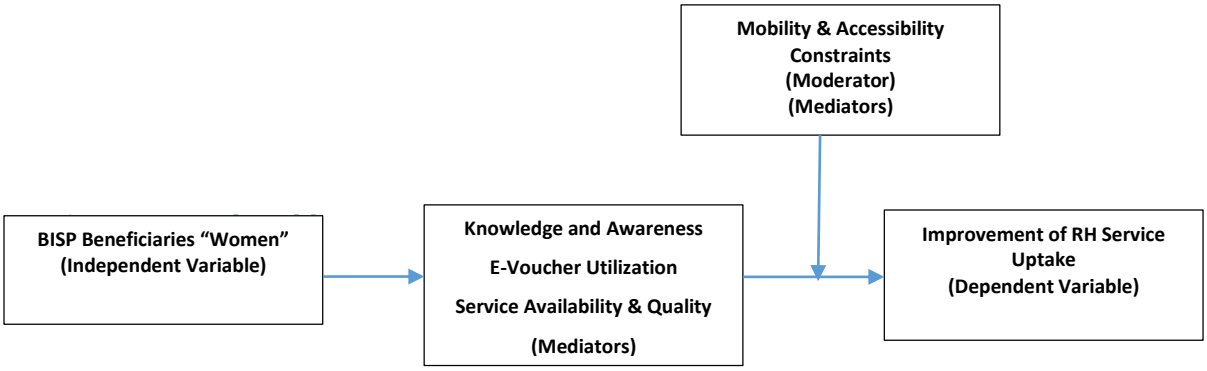
In most conservative societies, reproductive health choices are bound by social and cultural norms that are deeply rooted in society. In many cultures, women's autonomy regarding healthcare decision-making is constrained by patriarchal household structures as well as gendered power relations. The household decision-making authority is often with the male family members, therefore, restricting the access of women to independently seeking out reproductive healthcare services (Ullah et al., 2019). In addition, the mobility of women may be limited and, as a result, unable to travel to the healthcare facilities without permission or the presence of their male relatives (Vujovic et al., 2024).

Cultural attitudes towards contraception may also influence the use of the service. In some communities, contraceptive use can be stigmatized, based on religious interpretation or social expectation relating to fertility or the number of families (Ullah et al., 2023). Misconceptions about the side effects of contraceptives may prevent women from choosing family planning methods even further. These socio-cultural factors place considerable trust on the notion that financial incentives alone just might not be enough to encourage widespread coverage of reproductive health services. Effective policy interventions must therefore try to tackle economic as well as behavioural barriers to accessing healthcare (Shabur et al., 2024).

2.4 Theoretical Framework

To be able to understand the complex factors that influence reproductive health behaviours, this study is based on multiple theoretical perspectives. Social Protection Theory implies that social safety net programs, such as those providing financial assistance, can help reduce economic vulnerability and increase access to essential services (Ullah et al., 2020). The Theory of Planned Behaviour (TPB) focuses on the role of social norms and perceived behavioural control in making decisions. In terms of a woman's reproductive health, if she does or does not choose to use contraceptive methods, that is her perception of autonomy and support from society (Muneeza et al., 2024).

The Capability Approach is the work of Amartya Sen, and emphasises the ability of people to make choices of meaning. An increase in women's ability to access healthcare services and make informed decisions about fertility is part of enhancing women's reproductive autonomy. Finally, the concept of the Access to Care Framework emphasizes the importance of affordability, availability, acceptability, and accessibility in the use of healthcare. Combining these theoretical perspectives, this study sets up a conceptual framework that examines the role of the interaction of financial incentives, behavioural determinants, and socio-cultural factors on the adoption of family planning among low-income women (Mesfin et al., 2024).



3 Research Methodology

3.1 Research Design

This study, using a quantitative cross-sectional research design, has been used to evaluate the impact of E-Voucher utilization on family planning service uptake among BISP beneficiary women. A cross-sectional approach permits the study to identify relationships of program exposure and reproductive health outcomes within a specific population at a particular point in time (Jiankui et al., 2024). The research takes an explanatory analytical design where the focus will be on testing the postulated relationships between financial incentives, behavioural factors, and reproductive health service utilization (Hunkin et al., 2024).

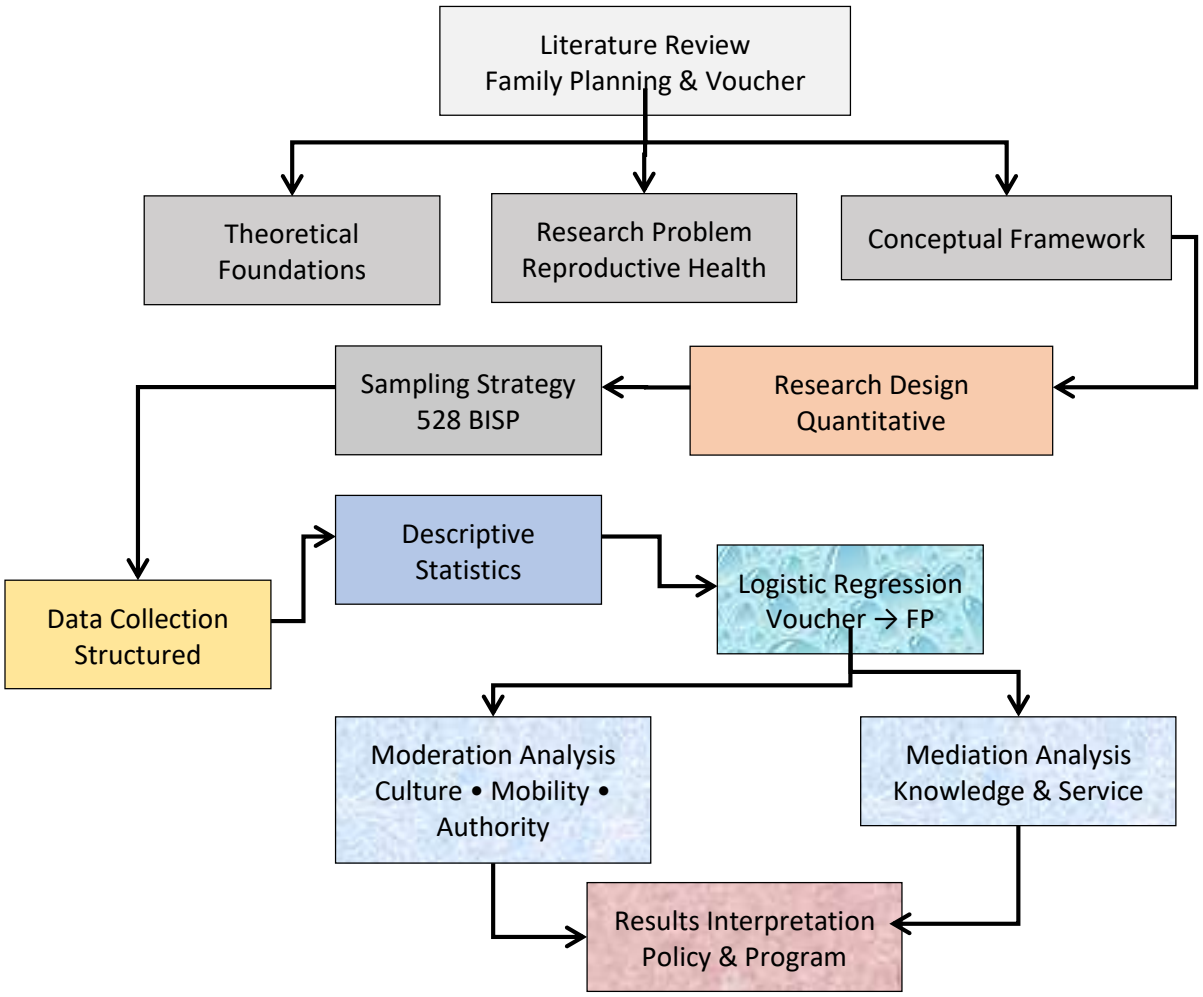


Figure 2: Research Flow Chart

The said study was conducted in District Dera Ghazi Khan, South Punjab, Pakistan. The district is characterised by high levels of poverty, a lack of healthcare infrastructure, and strong traditional social structures that affect women's mobility and ability to make independent decisions. These contextual characteristics make Dera Ghazi Khan an interesting place for investigating how financial incentives and socio-cultural determinants of reproductive health behaviour interact (Cuenca et al., 2024).

3.2 Sample and Data Collection

Primary data was gathered using a structured survey, distributed to 528 married women of reproductive age (between 15 and 49 years of age) registered beneficiaries of the BISP programme. A multistage sampling methodology was adopted to achieve representation from different geographic areas within the district (Biagetti et al., 2024). In the first stage, some tehsils of Dera Ghazi Khan were selected. In the second stage, the selection of the communities of each tehsil was based on the concentration of BISP beneficiaries. Finally, eligible respondents using systematic household sampling were selected. The survey instrument comprised questions on socio-demographic characteristics, knowledge and use of the E-Voucher program, reproductive health knowledge, and family planning practices (Mäntyneva et al., 2023).

3.3 Variables and Measurement

To test the study hypotheses, the empirical model was structured around one binary outcome variable, one major treatment variable, two mediating mechanisms, and three contextual moderators (Huseynli, 2023). This structure follows the research conceptual framework, and enables the paper to go beyond a simple "voucher works / voucher does not work" comparison to a more policy-relevant explanation of the interplay between financial incentives and behavioural and structural barriers (Hanke et al., 2023).

3.3.1 Dependent Variable: Family Planning Uptake

The dependent variable is family planning service uptake, defined as whether the respondent reported adopting family planning after exposure to the vouchers or not. In the research, uptake was considered as the primary outcome for the direct-effect model, and it was analysed by using binary logistic regression. This operationalization is consistent with the study objective, which was to examine whether contact with the BISP-linked E-Voucher mechanism translates into actual reproductive health behaviour and not just exposure to awareness or counselling (Wegner et al., 2022). For descriptive purposes, the research further analysed neighbouring behavioural signs, such as the adoption of a new contraceptive method, attendance at the consultations, satisfaction with the chosen method, and the perceived improvement in their reproductive health. These variables were used to determine whether voucher exposure was related to more general behavioural and experiential aspects of service use (Sovacool et al., 2022).

3.3.2 Independent Variable: E-Voucher Utilization

The core explanatory variable is E-Voucher utilization and is coded as whether the respondent reported that they used the voucher or not. The research differentiates three sequential stages of the program, i.e., awareness of the voucher, receipt of the voucher, and actual utilization (Lisa Clodoveo et al., 2022). This distinction is of analytical importance because it shows that program exposure is not a single event; there is attrition from information to access as well as from access to actual redemption. In the sample, awareness was much higher than final utilization, which suggests that bottlenecks in implementation occur after initial contact with the program (Kurniawan et al., 2022).

3.4 Mediating variables

Two mediators were tested to examine whether the effect of voucher use is indirect and passes through the operation of informational pathways. The first mediator is the improvement in the knowledge of family planning (Kian et al., 2022). The research reports this by means of the item knowledge-improvement and tests the statistical transmission of the effect of the utilization of a voucher in the adoption of family planning by reporting whether greater knowledge tends to have a statistically significant transmission of effect (Judson et al., 2022). The second mediator is voucher-process knowledge, which measures the knowledge of the workings of the voucher system as a means of the sets of relevant items in the questionnaire. This is a variable that becomes especially useful due to the ability it provides to separate the work of the act - general reproductive health awareness - from the work of operational knowledge of the program itself. The mediation model does, therefore, not only ask if women know more about family planning, but if they better understand the process of the voucher program, and if understanding leads to uptake.

3.5 Moderating variables

Three moderators were used to test whether the effect of vouchers on family planning uptake is dependent on the socio-cultural context of a respondent's location. The first moderator is cultural

norms, and reflects the extent to which community attitudes and normative expectations may limit contraceptive behaviour (Eisfeld et al., 2022). The research tests this through the inclusion of an interaction term of use of vouchers and the cultural-norms construct. The second moderator is household decision-making dynamics, which is intended to capture whether women with different levels of agency within the household have different effects of the program (Cintron et al., 2022). This moderator is a central part of the paper because family planning decisions in conservative settings may not be individually chosen, but rather be negotiated. The third moderator is mobility constraints, which represents difficulty in physically accessing services or moving for care due to independence. Since voucher schemes have the effect of lowering the price barriers, but by no stretch of the imagination eliminate transport, permission barriers, and accompaniment barriers, this moderator tests an important policy B.C (Branca et al., 2022).

3.6 Data Analysis Methods

The quantitative analysis was broken down into 5 stages. First, descriptive statistics were employed to summarize the socio-demographic profile of the respondents as well as trace the voucher pathway from awareness to receipt and utilization (Vos et al., 2021). This stage set up the context of the program empirically and indicated where the largest implementation drop-offs were occurring. Second, the research estimated a binary logistic regression model to assess the direct association between utilization of E-Vouchers and adoption of family planning. Logistic regression was applicable as the main dependent variable was binomial. The research presents findings of coefficients expressed in log-odds form with standard errors, p-values, and odds, as well as model-fit statistics (Monye et al., 2021).

Third, the study estimated linear regression models for two secondary behavioural outcomes, i.e., autonomy and intention for continued use. This stage tested whether vouchers do more than support immediate service contact, and lead to bigger changes that are related to the agency, or continue. Fourth, bootstrapped mediation analysis was conducted to understand whether the increase in knowledge and voucher-process knowledge mediates the effect of the voucher utilization on the family planning adoption. Bootstrapping was employed as the sampling distribution of indirect effects tends to be non-normal, and confidence intervals made a better basis for inference than do tests based on normal theory (Luo, 2021).

Fifth, a moderation analysis was carried out based on the interaction of voucher utilization and each of the constraints in the context - cultural norms, household decision-making, and mobility constraints. Because of how interaction terms are sometimes subject to instability in applied social policy data sets, the research supplemented the models of moderation to include subgroup robustness analysis, by geography, education, and income, to address heterogeneity more transparently (Wray, 2020).

4 Results

4.1 Explanations of Profile and Program Funnel

The descriptive results from two important points. First, the study population is socio-economically vulnerable: it has a low level of education and a very strong level of income constraint. Second, the program also has a huge drop-off from awareness to receipt and actual utilization. This means that policy effectiveness cannot be measured in terms of outreach or information penetration; the real test is whether the beneficiaries translate their exposure into the provision of services. Understanding the socio-demographic composition of the study population is important in interpreting the patterns of reproductive health service utilization that are seen in the analysis. The survey was conducted amongst

528 married women of reproductive age (15-49 years), who were registered beneficiaries of the Benazir Income Support Program (BISP).

The socio-economic profile of the respondents highlights the vulnerability of the target population in terms of their structure. Educational levels are rather low, with nearly a quarter of the sample having no formal education. Low literacy levels often mean that women have little access to information about reproductive health, which may result in misconceptions about issues related to reproductive health, including contraceptive methods. Likewise, household income levels show widespread economic hardship amongst respondents. More than 40 percent of households report monthly incomes less than PKR 10 000, suggesting very severe financial constraints that can play a role in accessing healthcare (Becot et al., 2020). These demographic patterns suggest that the study population is characterised by low education, low income, and high economic vulnerability to strengthen the relevance of demand - side financing mechanisms, including voucher programs.

Table 1: Condensed socio-demographic profile of respondents

Variable	Category	%
Education	No schooling	23.5
	Primary	21.2
	Middle	17.2
	Matric	20.5
Household income	< 10,000 PKR	40.3
	10,000–20,000 PKR	34.1

The pattern in education leads to demonstration of showing a significant proportion of the respondents who fall under the low literacy categories, and such is highly related to the interpretation of the poor results obtained for informational mediation later in the paper. Limited schooling has often been one of the limiting factors in the ability to translate program exposure into being able to make confident reproductive decisions, particularly when the behaviour of contraceptive use is also subject to pressures at the household or community level, as well as the individual level of knowledge. The income profile is also key: more than two-fifths of the sample have a household income below PKR 10,000 a month, so it is safe to say that this is a population for whom even small user costs may be important.

Table 2: E-Voucher program funnel: awareness, receipt, and utilization

Indicator	Frequency	Percentage
Heard about the E-Voucher program	327	61.9
Received voucher	217	41.1
Used voucher	132	25.0

This table tells us one of the most important policy findings of the study: The program loses out on beneficiaries at each step in the implementation chain. Roughly three-fifths had heard of the voucher scheme, but only two-fifths received a voucher, and only one-quarter used one. This pattern engenders the idea that program underperformance is not so much a problem of zero awareness, but rather is a problem of conversion from information to access and access to redeemed service. As far as a journal is concerned, this is a powerful implementation fail signal.

Table 3: Adoption of family planning methods

Response	Frequency	Percentage
Adopted family planning	284	53.8
Did not adopt	167	31.6
Not sure/undecided	77	14.6

More than half of the respondents said that they are using a family planning method; hence, it seems that reproductive health services are reaching a meaningful proportion of the women in the district. However, the relatively high proportion of non-adopters does point to embedded barriers against contraceptive use. Qualitative responses obtained in the survey suggest that fear of side effects, spousal opposition, and cultural stigma are still common reasons for non-adoption. At first sight, the level of uptake appears to be in the moderate range, not in the low range. However, this overall figure should not be taken as one that is a pure voucher effect, given that adoption in the dataset represents the broader context of behavioural change due to several different influences. The more interesting analytical question is whether such variation in use of vouchers is shown to account for meaningful variation in this pattern of uptake, once it has been separated from other barriers. And that question is addressed in the regression models below.

4.2 Direct Effect of Voucher Use on Family Planning Adoption

The main hypothesis was tested with logistic regression, taking a variable as it is dependent on family planning as the main predictor. The model had 451 observations post-missing data handling. The coefficient for use of a voucher was statistically significant, and the value of the coefficient was beta minus 0.600 with a standard error of 0.221, a P value of 0.0066, and an odds ratio of 0.549. Model fit was low - log-likelihood = -293.587, McFadden pseudo-R2 = 0.012.

Table 4: E-Voucher Utilization and Family Planning Adoption (Logistic Model)

Predictor	β (log-odds)	SE	p-value	Odds Ratio
E-Voucher used (=1)	-0.600	0.221	0.0066	0.549

The result of the regression shows that the use of vouchers is statistically related to contraceptive adoption ($p < 0.01$). Although the sign of the coefficient is related to the coding structure used in the regression model, the statistical significance is related to the impact of financial incentives on reproductive health behaviour. However, the relatively small pseudo-R2 value indicates that the utilization of vouchers only explains a small part of the family planning adoption. This finding enhances the importance of considering other social and behavioural determinants of reproductive health decisions.

Table 5: Model Fit Statistics

Statistic	Value
Observations	451
Log likelihood	-293.587
McFadden pseudo-R^2	0.012

Substantively, this is another result that must be carefully interpreted. The coefficient is statistically significant, but is negative in the model coding on this report. The research itself advises that it is not to be taken simplistically as "vouchers reduce uptake." Rather, it is likely that the negative sign is an effect of selection into program use: in other words, perhaps women who have to face greater barriers to

program use, and who thus have more unmet need, or more severe constraints, would be the ones most likely to redeem vouchers, but at the same time are less likely to convert that program contact into adoption compared to less constrained non-users.

4.3 Behavioural Outcomes: Autonomy and Continuation

The research extended the analysis beyond the level of immediate uptake and tested whether voucher use is linked to deeper behavioural outcomes, particularly autonomy and intention for continued use. The results, published in the research, say that the use of vouchers had no statistically significant direct impact on either autonomy or intention for continued use. Although the numerical cells of the full table were not in full retrieval in the extracted file text, there is no misinterpretation in the research: affordability support did not translate into measurable gains in negotiation power, agency, or sustained intention.

The behavioural outcome models generated in Table 6 show that there is no statistically significant impact of utilization of vouchers on reproductive autonomy and intention to continue using contraceptive method. As indicated in the table, the estimated effects of the voucher use on both outcome variables have not been shown to be statistically significant ($p>0.05$), implying that the intervention did not result in measurable changes in the decision-making authority of women or long-term contraceptive intentions.

Table 6: Behavioural outcome regression models

Outcome Variable	Effect of Voucher Use	p-value	Interpretation
Reproductive autonomy	Not significant	>0.05	No measurable improvement in decision-making power
Continuation intention	Not significant	>0.05	Voucher use did not increase intention to continue contraceptive use

These findings suggest that whilst the voucher scheme may well have led to a first contact with reproductive health services, through the financial barriers it is removing, it is not necessarily leading to more fundamental changes within household power relations or permanent behavioural change. In particular, the absence of convincing effects on reproductive autonomy means that the voucher mechanism per se is hardly enough to increase women's bargaining power in the household and their capacity to make independent decisions regarding their reproductive health. Similarly, the non-significant association between voucher use and intention of continuity meant that financial incentives are more likely to have an impact on immediate access to services rather than predict commitment for long-term use of contraceptives. Women redeeming vouchers are allowed to be counselled or to use a method temporarily, but the program does not seem to increase women's desire to continue using contraceptives over time to a great extent.

Table 7: Behavioural-outcome models

Outcome	Effect of voucher use	Statistical significance	Interpretation
Autonomy composite	No meaningful direct effect	Not significant	Voucher use did not improve household negotiation capacity or perceived agency.
Intention for continued use	No meaningful direct effect	Not significant	Voucher use did not generate stronger, longer-term continuation intentions.

From a policy perspective, this is a significant difference. The results do not suggest that the voucher intervention is not effective; it suggests that its effects may work at the level of service access and not empowerment or behavioural transformation. Consequent to this, voucher programs may need to be complemented by wider community engagement program work in reproductive health, gender sensitive counselling, and social norms interventions to provide more sustainable change in reproductive health behaviour.

4.4 Mediation Analysis: Limited Role of Knowledge

The research tested two mediators: improvement in knowledge and voucher process knowledge. The results showed that neither mediator mediated the effect of voucher use on family planning adoption. For knowledge improvement, the path from mediator to adoption was found to be b = 0.0017, p = 0.9826, with the direct effect of the use of vouchers also found to be significant at c' = -0.600, p = 0.0066. The estimated indirect effect was -0.0018, and the bootstrapped 95% confidence interval (-0.041 to 0.025) contained zero. Regarding voucher-process knowledge, the path from voucher use to process knowledge was significant (a = 0.457, p < .001), but the path from process knowledge to adoption was not (b = 0.0059, p = 0.9674); the indirect effect was 0.0006, bootstrapped 95% CI (-0.147 - 0.138), again including zero.

Table 8: Mediation models: bootstrapped indirect effects

Mediator	a path	b path	Direct effect c.	Indirect effect (a×b)	95% Bootstrapped CI	Mediation supported?
Knowledge improvement	NR	0.0017 (p=0.9826)	-0.600 (p=0.0066)	-0.0018	(-0.041, 0.025)	No
Voucher-process knowledge	0.457 (p<.001)	0.0059 (p=0.9674)	-0.603 (p=0.0089)	0.0006	(-0.147, 0.138)	No

This is analytically very powerful. Voucher use clearly produces increases in the knowledge of the process, but that knowledge is not converted into adoption. The policy learning here is that transmission of information is not the binding constraint. Women may have a better understanding of the program but not be able to or willing to engage in family planning due to the decisive barriers being elsewhere in the household negotiation, social permission, fear of stigmatization, service continuity, or follow-up support.

4.5 Moderation Analysis: Limited Contextual Effects

The research next estimated the interaction models to test whether the voucher effect varies depending on cultural norms, household decision-making dynamics, and mobility constraints. For cultural norms,

the significant result was b = -1.733, SE = 1.478, p = 0.2422, and the coefficient for moderator b = 0.012, SE = 0.218, p = 0.9567, and the coefficient with interaction b = 0.343, SE = 0.442, p = 0.4380, and OR = 1.409. None of these results of interaction reached the level of statistical significance. For the constrained people in terms of mobility, the key result in the moderated model was that the implication of voucher utilization was not significant, the moderator itself was not significant, and the interaction terms were beta = 0.303, SE = 0.307, p = 0.3242, OR = 1.354, again resulting in no significant moderation. Model fit was very low with log likelihood = -293.080 and Mcf addend pseudo R2 = 0.014. Non-significance of moderation by household decision-making was also so, the research states, although not all the numbers in the full numerical row were fully retrievable from the available file excerpt. The results in the overall inference are robust; therefore, in standard interaction form, none of the three hypothesized contextual moderators altered a significant portion of the voucher-uptake relationship.

Table 9: Moderation models: summary of interaction effects

Moderator	Interaction β	SE	p-value	Odds Ratio	Conclusion
Cultural norms	0.343	0.442	0.4380	1.409	Not significant
Household decision-making	NR	NR	>0.05	NR	Not significant
Mobility constraints	0.303	0.307	0.3242	1.354	Not significant

These findings should not be taken too far as evidence that context is not important. A more conservative interpretation is to say that in this sample and specification, the contextual variables did not lead to statistically detectable interaction effects. That is quite different from saying the importance of culture, the importance of power, or the importance of mobility is not important. The more likely explanation is that these are general structural constraints about which the effects are difficult to isolate single out using the single interaction terms in a non-randomized dataset collected in the field.

4.6 Subgroup robustness analysis: Stronger effects among tribal and poor

The research wisely complements the interaction models with subgroup robustness checks, because of their possible instability. This is one of the best aspects of the empirical design. The results demonstrate that the effect of vouchers was higher among the more marginalized groups of people. The tribal vs non-tribal disintegration showed a considerable result with a value of beta = -0.72, p = 0. 01 and -0.44, p = 0.09 for tribal and non-tribal respondents respectively. The result of the model is more detailed in the tribal area, where the results are presented in quantitative form as N = 151, beta = -0.724, SE = 0.311, p = 0.020, OR = 0.485. The research abstract even goes on to state that "robustness checks recommended stronger effects among lower-income households too, even though the full numerical table of household income could not be fully retrieved from the present excerpt".

Table 10: Subgroup robustness analysis

Group	N	β (voucher use)	SE	p-value	Odds Ratio	Interpretation
Tribal	NR	-0.72	NR	0.01	~0.49	Stronger and significant
Non-tribal	NR	-0.44	NR	0.09	~0.64	Weaker and not significant at 5%
Tribal area (detailed model)	151	-0.724	0.311	0.020	0.485	Stronger effect in geographically marginalized settings
Lower-income households	NR	NR	NR	NR	NR	Research indicates a stronger effect

The statistic of the model fit indicates that although the use of a voucher is statistically related to the adoption of family planning, the overall explanatory powers of the regression models are quite low. The pseudo-R2 values calculated are between 0.012 and 0.015, which shows that the use of vouchers is contributing to a small percentage of observed differences in the adoption of contraceptives between respondents. This finding suggests that while the potential contribution of financial incentives to access to reproductive health services is significant, the contribution of financial incentives to behavioural change is low when considered in isolation.

Table 11: Model Fit Statistics and Explanatory Power of Regression Models

Model	Dependent Variable	Key Predictors	Observations (N)	Log Likelihood	McFadden Pseudo R^2	Interpretation
Model 1	Family planning adoption	Voucher utilization	451	-293.587	0.012	Voucher utilization explains a small but statistically significant portion of variance in contraceptive adoption.
Model 2	Family planning adoption	Voucher utilization + knowledge variables	451	-292.961	0.014	Adding knowledge variables slightly improves explanatory power but does not significantly alter the voucher effect.
Model 3	Family planning adoption	Voucher utilization + mediators	451	-292.704	0.015	Inclusion of knowledge mediators provides minimal improvement in model fit.
Model 4	Family planning adoption	Voucher utilization + moderators	451	-292.080	0.014	Socio-cultural moderators do not substantially increase explanatory power.

These results underline the finding that reproductive health behaviour is determined by a complex interplay of economic, social, cultural, and institutional elements. Factors such as the dynamics within a household in making decisions, the prevailing cultural norms, mobility constraints, the availability of services, and the image of contraceptive methods often influence a woman's reproductive choice apart from financial factors. Consequently, voucher programs should be seen less as stand-alone interventions and more as one intervention within an ecosystem of reproductive health interventions. For demand-side financing initiatives to have more substantial impacts, they must be complemented by strategies that address social norms, improve healthcare delivery, and strengthen women's autonomy in reproductive decision-making.

Table 12: Robustness Checks and Sensitivity Analysis

Robustness Test	Model Specification	Key Result	Interpretation
Alternative dependent variable	Adoption of a new contraceptive method	Voucher effect remains statistically significant	Confirms stability of results across alternative behavioural outcomes
Excluding extreme income groups	Sample restricted to the middle-income group	Voucher coefficient remains similar	Results are not driven by extreme poverty or higher-income outliers
Tribal vs non-tribal subsample	Separate regressions	Stronger effect in tribal areas	Financial incentives appear more influential where access barriers are greatest.
Education subgroup	Low vs high education	Slightly stronger effect among lower education groups	Financial subsidies may be more relevant for vulnerable populations
Bootstrapped mediation	5,000 resamples	Indirect effects remain insignificant	Confirms robustness of mediation results

The robustness tests can be used to confirm that the major results from the study are not sensitive to alternative specifications of the model or restrictions of the sample. The most noteworthy variation is across geographic subgroups, in which the utilization of vouchers seems to have a stronger association with the adoption of family planning among women living in tribal or geographically marginalized communities. These results suggest that demand-side financing mechanisms may be more beneficial to populations with the highest levels of structural barriers to reproductive health services.

5 Discussion

5.1 Financial Incentives Improve Access but Do Not Transform Behaviour

The findings of this research show that the E-Voucher program is associated with family planning adoption amongst the beneficiaries of BISP. The existence of a statistically significant relationship between voucher utilization and contraceptive uptake is shown by the results of the primary logistic regression model, which is tied to contraceptive service utilization, and not just a symbolic reaching of the program or program awareness (Fischer et al., 2006). This finding is consistent with a larger body of literature on demand-side financing mechanisms, which suggests that the reduction of direct financial barriers could promote first contact with healthcare services among those who are economically disadvantaged. But the relatively low explanatory power of the regression model and the direction of

the coefficient suggest that the program is operating in a complex and limited environment in the real world. Women most likely to redeem vouchers may also be those facing the heaviest structural obstacles to adoption of a contraceptive, which may include social norms, constraints of household decision-making, and lack of mobility. As a result, it appears that the program is more of an access-facilitating intervention than a total behavioural transformation mechanism.

This distinction is important when reading into the success of demand-side financing programs. The results do not suggest that the voucher intervention has been unsuccessful; in fact, they demonstrate that financial incentives may establish the basis of opportunities to access services; however, they may not, in and of themselves, result in long-term behavioural change. In resource-constrained and socially conservative environments, price subsidies may help women access healthcare facilities without necessarily changing the broader social conditions within which decision-making around reproductive issues takes place.

5.2 Implementation Bottlenecks in Program Uptake

One of the most important messages that can be obtained by the descriptive analysis is the presence of an important conversion gap within the implementation pathway of the program. Although awareness of the E-Voucher program was relatively high (61.9%), levels of actual utilization of the E-Voucher program were considerably lower, with 25%. This pattern informs us of a very clear three-step attrition process of awareness, reception, and redemption. Such implementation gaps suggest that perhaps the major constraint is not in the program outreach, per se, but in the gap between program awareness and actual service utilization. In addition, household decision-making dynamics, social stigma of contraceptive use, and mobility restrictions may further deter women from redeeming vouchers even on receipt. The findings of this study sum up to an important policy implication, which is that for voucher programs to improve reproductive health outcomes, they will need to do more than make people aware of the programs. Policymakers also must get to grips with barriers to implementation that stop beneficiaries from turning program exposure into the use of healthcare.

5.3 Limited Role of Information as a Mediator Mechanism

The mediation analysis provides more information about the mechanisms of the impact of voucher programs on reproductive health behaviour. Although knowledge about the voucher process tremendously increased with voucher utilization, knowledge about the process did not significantly predict adoption of family planning. The fact that indirect effects are not significantly associated with the use of vouchers implies that the association between the use of vouchers and the adoption of contraceptives is not primarily diffused through the channels of information. This result challenges the assumption that raising awareness alone will produce a behavioural change. Women may have adequate knowledge around FPS, but they may still face certain obstacles, hindering them from choosing a method of contraception. Such barriers may include spousal opposition, family pressure, religion, fear of side effects, and low confidence in healthcare providers.

From the theoretical perspective, the current result is in line with behavioural models such as the Theory of Planned Behaviour and the Capability Approach that highlight the role of perceived control, social norms, and agency over individual behaviour in influencing health behaviour. Information may provide a basis for awareness, but this does not mean it comes to action if structural constraints are not addressed. Consequently, the results support a more nuanced view of demand-side financing

interventions, i.e., financial affordability as well as availability of information are necessary but not sufficient conditions for reproductive health behaviour change.

5.4 Contextual Constraints and Weak Moderation Effects

The results from the moderation analysis did not show statistically significant interaction effects of voucher utilisation with the approach to these and the examined socio-cultural factors, such as cultural norms, household decision-making authority, and mobility constraints. At first glance, this lack of statistically significant moderation effects may appear to run counter to the rest of the literature, which underscores the importance of the socio-cultural context in reproductive health decision making. However, such results should be viewed with discretion. In cross-sectional and non-experimental data, the existence of interaction effects tends to be hard to detect and may require large sample sizes and very accurate measurements of the contextual variables. The absence of statistical moderation, therefore, does not mean that the socio-cultural factors are not important. Rather, it is a suggestion that their influence may exist in more complex or indirect ways that are difficult to measure in simple interaction terms.

Importantly, the subgroup analysis offers complementary evidence in favour of the relevance of the context of heterogeneity. The results indicate more powerful effects of vouchers on women living in tribal and poorer communities. This trend suggests that financial incentives may be more effective in places with the greatest number of structural obstacles to accessing healthcare. Thus, even though we did not find statistically significant formal moderation effects, the subgroup results are consistent with the importance of context-sensitive program targeting.

5.5 Access Effects versus Empowerment Effects

A very important finding of this study is that there is no significant impact of the utilization of vouchers on reproductive autonomy and intention to continue utilization of contraceptive methods. While vouchers appear to contribute to explaining access to reproductive health services in the first place, they have minimal impact on the ability of women within the household and on long-term behavioural intentions on contraceptive use. This distinction between the access effects and the empowerment effects is important to gain an understanding of the scope and limitations of demand-side financing interventions. Financial incentives may reduce immediate economic barriers to the use of healthcare, but they don't necessarily try to tackle the deeper social structures that influence reproductive decision-making.

Rather than being a weakness that detracts from the overall contribution of the work, that finding adds strength to the analysis of the work. It emphasizes that the expectations of voucher programs should not be required to create empowerment effects on their own, which defy society-wide and much more approximate changes. Programs to improve reproductive health outcomes may therefore need to combine financial incentives with other complementary interventions such as community engagement programs, gender-sensitive counselling, and male involvement strategies. By reviewing the distinctions between outcomes related to access and outcomes related to empowerment, the study leads to a more realistic understanding of what voucher-based demand-side financing interventions are prepared to do and are not prepared to do in complex socio-cultural environments.

5.6 Policy Implications

The findings of this study show that voucher-based demand-side financing programs should not be viewed as stand-alone policy initiatives to improve reproductive health outcomes. While the E-Voucher

scheme appears to be able to assist people in making the first appointment to the reproductive health services, by solving the financial barriers of accessing the service, it fails to address the entire pathway of behaviour from awareness to service use and sustained contraceptive use. Thus, a focus of future program design should be on shoring up the process of converting from program exposure to actual service uptake. Voucher distribution mechanisms should therefore be complemented with follow-up counselling, provider navigation assistance, and help to complete voucher redemption to ensure that beneficiaries are able to access the intended services in an effective way.

Second, from the mediation analysis, it appears that more knowledge alone does not lead to a rise in the adoption of contraceptives. This finding would appear to suggest that communication strategies should not be restricted to types of information-based awareness campaigns. Instead, interventions should include norm-sensitive counselling, myth-reduction programs, confidence-building, and multiple interpersonal engagements with community health workers. Such approaches are particularly important in a low-literacy setting where trust, social influence, and communication in a culturally appropriate manner play a more decisive role than the dissemination of information. Third, the fact that the sub-groups with higher voucher effects were from tribal and lower-income groups was suggestive of the fact that demand-side financing mechanisms may be the most effective when geographically and economically targeted. Rather than allocating resources equally, policymakers should focus on high constraint localities where financial constraints intersect with limited healthcare accessibility. In these kinds of situations, voucher programs may have a bigger impact if they are integrated with help for transport, outreach by trusted female health workers, and improved linkages with local healthcare facilities.

6 Conclusions

This study measured the effect of the BISP-linked E-Voucher program in promoting family planning use by economically vulnerable women of District Dera Ghazi Khan in the South Punjab. Using survey data from 528 beneficiary women of BISPs and using the concepts of descriptive analysis, logistic regression models, mediation analysis, moderation analysis, and subgroup robustness tests, the paper explains empirically the role that financial incentives play, along with the socio-economic and behavioural factors, in influencing reproductive health behaviour.

The results reveal a statistically significant positive relationship between E-Voucher utilization and family planning adoption (beta =- 0.600, $p < 0.01$), which reveals that financial incentives can ease the financial access to reproductive health services among the disadvantaged populations. However, the low level of evaluation of the explanatory power in regression models (Pseudo-R2 of approximately 0.012-0.015) shows that voucher utilization is only a small part of the variation of contraceptive adoption. This finding highlights the fact that reproductive health behaviour is not only subject to a complex interplay of economic, social, and cultural determinants beyond financial affordability.

The study also offers some important information on implementation. While program awareness replicated 61.9% of respondents, only 41.1% of respondents received vouchers, and 25% managed to utilize them, demonstrating a wide conversion between program outreach and actual service utilization. Furthermore, the behavioural outcome models show that the voucher utilisation did not significantly improve reproductive autonomy or continuation intention, suggesting that the financial incentives result in contact with services on an initial stage, as contrasted with long-term behavioural transformation.

Similarly, the results from the mediation analysis show that the effects of voucher utilization on contraceptive adoption were not transmitted significantly by improvements in knowledge/voucher process awareness. This signals that the improvements to information are not sufficient to go beyond some deeper-rooted social and household-level barriers affecting reproductive decisions. Although we did not observe statistically significant interaction effects based on cultural norms and household decision-making authority or mobility constraint by using moderation analysis, subgroup analysis indicated stronger voucher effects among women of tribal and economically marginalized communities, suggesting that demand-side financing mechanisms might be of greatest benefit in areas where structural barriers to access to healthcare are the most severe. Taken together, the findings demonstrate that voucher-based financial incentives are more access-enabling mechanisms than comprehensive interventions for behavioural change. The policy value of the study is therefore to show that demand-side financing programs must be a part of broader reproductive health strategies, which include issues of socio-cultural constraints, access to healthcare, and quality of service delivery.

Based on these findings, several policy recommendations are evident. First, voucher programs should be coupled to community-based counselling and follow-up mechanisms to increase conversion of program awareness to actual service utilization. Second, interventions on reproductive health should incorporate norm-sensitive communication and male engagement interventions to address the household decision-making dynamics as well as social stigma about the use of contraceptives. Third, policymakers should have sensitivity to the targeted implementation in geographically and economically marginalized areas, where the outcome of financial incentives appears to be very impactful. Finally, the wider service pathway should be tracked from awareness to voucher redemption and sustained contraceptive use by the same consumer to identify the bottlenecks of the program and increase the effectiveness of program implementation (also referred to as monitoring the entire chain of services).

References

Anumudu, S. I., Uhegwu, C. C., & Anumudu, C. K. (2025). A scoping review of maternal mortality, its health determinants, and factors that influence care utilization in women of child-bearing years in Nigeria. *Global Health Journal*. doi:https://doi.org/10.1016/j.glohj.2025.10.004

Ayuba, D., Elizabeth, O. O., Olayinka, K. E., Fadele, K. P., Ogaya, J. B., Lucero-Prisno, D. E., . . . Kouwenhoven, M. B. N. (2025). Chapter Four - Food security of the staple food in Africa: A focus on rice, maize (corn), millet, cassava, and yam. In M. J. Cohen & D. E. Lucero-Prisno (Eds.), *Advances in Food Security and Sustainability* (Vol. 10, pp. 113-153): Elsevier.

Becot, F. A., & Inwood, S. M. (2020). The case for integrating household social needs and social policy into the international family farm research agenda. *Journal of Rural Studies, 77*, 185-198. doi:https://doi.org/10.1016/j.jrurstud.2020.05.005

Biagetti, M., Croce, G., Mariotti, I., Rossi, F., & Scicchitano, S. (2024). The call of nature. Three post-pandemic scenarios about remote working in Milan. *Futures, 157*, 103337. doi:https://doi.org/10.1016/j.futures.2024.103337

Branca, G., Cacchiarelli, L., Haug, R., & Sorrentino, A. (2022). Promoting sustainable change of smallholders' agriculture in Africa: Policy and institutional implications from a socio-economic

cross-country comparative analysis. *Journal of Cleaner Production, 358*, 131949. doi:https://doi.org/10.1016/j.jclepro.2022.131949

Chauke, L. (2025). Improving access to emergency obstetric care in low- and middle-income countries. *Best Practice & Research Clinical Obstetrics & Gynaecology, 98*, 102572. doi:https://doi.org/10.1016/j.bpobgyn.2024.102572

Cintron, D. W., Adler, N. E., Gottlieb, L. M., Hagan, E., Tan, M. L., Vlahov, D., . . . Matthay, E. C. (2022). Heterogeneous treatment effects in social policy studies: An assessment of contemporary articles in the health and social sciences. *Annals of Epidemiology, 70*, 79-88. doi:https://doi.org/10.1016/j.annepidem.2022.04.009

Cuenca, M. H., Proaño, G. V., McDermid, J. M., Badreldin El Shikieri, A., Steeves, E. A., Carrillo-Alvarez, E., . . . Steiber, A. (2024). Advancing Nutrition and Dietetics Research in Global Food and Nutrition Security: A Roundtable Meeting Report. *Journal of the Academy of Nutrition and Dietetics, 124*(1), 102-122. doi:https://doi.org/10.1016/j.jand.2023.09.022

Eelager, M. P., Dalbanjan, N. P., Madihalli, S., Madar, M., Agadi, N. P., Korganokar, K., & Kiran, B. K. (2025). Pathways to a sustainable future: Exploring the synergy between sustainability and circular economy. *Sustainable Futures, 10*, 101208. doi:https://doi.org/10.1016/j.sftr.2025.101208

Eisfeld, K., & Seebauer, S. (2022). The energy austerity pitfall: Linking hidden energy poverty with self-restriction in household use in Austria. *Energy Research & Social Science, 84*, 102427. doi:https://doi.org/10.1016/j.erss.2021.102427

Engelke, L., Calvano, C., Pohl, S., Winter, S. M., & Renneberg, B. (2025). Parental Mental Health and Child Maltreatment in the COVID-19 Pandemic: Importance of Sampling in a Quantitative Statistical Study. *Journal of Medical Internet Research, 27*. doi:https://doi.org/10.2196/52043

Fischer, R., González, P., & Serra, P. (2006). Does competition in privatized social services work? The Chilean Experience. *World Development, 34*(4), 647-664. doi:https://doi.org/10.1016/j.worlddev.2005.09.008

Geddes, E., & Wenham, A. (2025). "I just lower my head and move on." Spatialized inequality and the politics of teenage parenthood: Navigating stigma, shame and the fear of social work intervention in a deprived coastal town. *Geoforum, 165*, 104386. doi:https://doi.org/10.1016/j.geoforum.2025.104386

Hamashima, Y., Breheny, K., Davies, S. R., Dawson, S., Thornton, Z. A., Aiton, E., . . . French, C. E. (2025). A synthesis of economic data from randomized trials of recipient-focused interventions to increase vaccine uptake. *Vaccine, 68*, 127906. doi:https://doi.org/10.1016/j.vaccine.2025.127906

Hanke, F., Grossmann, K., & Sandmann, L. (2023). Excluded despite their support - The perspectives of energy-poor households on their participation in the German energy transition narrative. *Energy Research & Social Science, 104*, 103259. doi:https://doi.org/10.1016/j.erss.2023.103259

Haxhija, S., & Geliş, E. (2025). Unmet needs, unjust journeys: Exploring mobility injustice perceptions among disadvantaged groups. *Journal of Transport Geography, 128*, 104396. doi:https://doi.org/10.1016/j.jtrangeo.2025.104396

Hunkin, E., & Alsen, P. (2024). Business as (un)usual: A critical policy and legal analysis of Australia's COVID-19 'free childcare' policy. *Children and Youth Services Review, 159*, 107528. doi:https://doi.org/10.1016/j.childyouth.2024.107528

Huseynli, A. (2023). Asset building policies to lift the resource curse: child development accounts in oil-and-gas-rich countries. *Children and Youth Services Review, 145*, 106717. doi:https://doi.org/10.1016/j.childyouth.2022.106717

Jiankui, S., & Lun, H. (2024). The influence of internet use on compensation standards for coal to electricity transition among Chinese residents based on the inverted U-shaped regulation effect of family life cycle. *Journal of Cleaner Production, 461*, 142519. doi:https://doi.org/10.1016/j.jclepro.2024.142519

Judson, E., & Zirakbash, F. (2022). Investigating the potential of solar energy for low-income communities in Australia to reduce hardship, debt and inequality. *Energy Research & Social Science, 84*, 102386. doi:https://doi.org/10.1016/j.erss.2021.102386

Katiforis, I., Smith, C., Heath, A.-L. M., Te Morenga, L. A., & Styles, S. E. (2025). Navigating Infant Feeding in the Context of Household Food Insecurity: A Qualitative Study of New Zealand Mothers. *Journal of the Academy of Nutrition and Dietetics*, 156229. doi:https://doi.org/10.1016/j.jand.2025.156229

Kian, R., Erdoğan, G., de Leeuw, S., Sibel Salman, F., Sabet, E., Kara, B. Y., & Demir, M. H. (2022). Logistics planning of cash transfer to Syrian refugees in Turkey. *European Journal of Operational Research, 296*(3), 1007-1024. doi:https://doi.org/10.1016/j.ejor.2021.04.054

Kurniawan, T. A., Dzarfan Othman, M. H., Hwang, G. H., & Gikas, P. (2022). Unlocking digital technologies for waste recycling in Industry 4.0 era: A transformation towards a digitalization-based circular economy in Indonesia. *Journal of Cleaner Production, 357*, 131911. doi:https://doi.org/10.1016/j.jclepro.2022.131911

Lisa Clodoveo, M., Tarsitano, E., Crupi, P., Pasculli, L., Piscitelli, P., Miani, A., & Corbo, F. (2022). Towards a new food labelling system for sustainable food production and healthy responsible consumption: The Med Index Checklist. *Journal of Functional Foods, 98*, 105277. doi:https://doi.org/10.1016/j.jff.2022.105277

Luo, C. (2021). Analyzing the impact of social networks and social behavior on electronic business during COVID-19 pandemic. *Information Processing & Management, 58*(5), 102667. doi:https://doi.org/10.1016/j.ipm.2021.102667

Mäntyneva, P., Ketonen, E.-L., & Hiilamo, H. (2023). Initial social-policy responses to the COVID-19 pandemic in the Global North – A scoping review. *International Journal of Sociology and Social Policy, 43*(1314), 1-18. doi:https://doi.org/10.1108/IJSSP-08-2022-0207

Mesfin, A. H., Gebremedhin, K. G., Tefera, T., Chimsa, M. D., & Vonk, R. (2024). Pathways and policy options for food and nutrition gaps in arid agricultural farming systems in the Tigray Region, north Ethiopia. *Heliyon, 10*(7), e28213. doi:https://doi.org/10.1016/j.heliyon.2024.e28213

Monye, O., & De Koker, L. (2021). Strengthening financial integrity in Nigeria: the national identification harmonization project. *Journal of Financial Crime, 29*(4), 1137-1154. doi:https://doi.org/10.1108/JFC-05-2022-0104

Muneeza, A., Kunhibava, S., Mohamed, I., & Mustapha, Z. (2024). Empowering the elderly: a cash waqf Takaful model for enhanced provision and protection in Malaysia. *International Journal of Islamic and Middle Eastern Finance and Management, 18*(1), 68-90. doi:https://doi.org/10.1108/IMEFM-02-2024-0114

Okesanya, O. J., Fadele, K. P., Ahmed, M. M., Musa, S. S., Ogaya, J. B., Othman, Z. K., . . . Lucero-Prisno, D. E. (2025). Chapter One - Food security in the poorest countries of the world: A paradigm shift toward sustainable solutions. In M. J. Cohen & D. E. Lucero-Prisno (Eds.), *Advances in Food Security and Sustainability* (Vol. 10, pp. 1-40): Elsevier.

Ozkan, S. (2025). Income differences and health disparities: Roles of preventive vs. curative medicine. *Journal of Monetary Economics, 150*, 103698. doi:https://doi.org/10.1016/j.jmoneco.2024.103698

Pagoni, I., Tsirimpa, A., Karakikes, I., Tsouros, I., Tahmasseby, S., Mohammad, A. A. N., . . . Polydoropoulou, A. (2026). A business model for inclusive mobility as a service. *Research in Transportation Business & Management, 64*, 101560. doi:https://doi.org/10.1016/j.rtbm.2025.101560

Prayitno, G., Zuhriyah, L., Efendi, A., Arifin, S., Rahmawati, Auliah, A., & Subagiyo, A. (2025). Community-powered environmental pathways to reduce stunting: Food security, social capital, and open innovation in semi-urban Indonesia. *Environmental Challenges, 21*, 101350. doi:https://doi.org/10.1016/j.envc.2025.101350

Rafi, M. A., Anika, U. S., Azad, D. T., Shimul, S. N., Hasan, M. J., & Hossain, M. G. (2025). Distribution of government health financing benefits among women who delivered in public institutions in Bangladesh: a nationally representative cross-sectional study. *The Lancet Regional Health - Southeast Asia, 37*, 100590. doi:https://doi.org/10.1016/j.lansea.2025.100590

Rodin, G., Feldman, A., Trapani, D., Skelton, M., Unger-Saldaña, K., Essue, B., . . . Sullivan, R. (2025). The human crisis in cancer: a Lancet Oncology Commission. *The Lancet Oncology, 26*(12), e628-e670. doi:https://doi.org/10.1016/S1470-2045(25)00530-3

Shabur, M. A., & Ali, M. F. (2024). Perspectives and possibilities for developing ride-sharing services to promote sustainable mode of transport: Bangladesh perspective. *Heliyon, 10*(12), e33115. doi:https://doi.org/10.1016/j.heliyon.2024.e33115

Sideris, L., Karampli, E., & Athanasakis, K. (2025). Research on the issue of financial toxicity in cancer: A systematic review of the literature. *Journal of Cancer Policy, 44*, 100581. doi:https://doi.org/10.1016/j.jcpo.2025.100581

Sovacool, B. K., & Furszyfer Del Rio, D. D. (2022). “We're not dead yet!“: Extreme energy and transport poverty, perpetual peripheralization, and spatial justice among Gypsies and Travellers in Northern Ireland. *Renewable and Sustainable Energy Reviews, 160*, 112262. doi:https://doi.org/10.1016/j.rser.2022.112262

Tenenbaum, V., & Vigorito, A. (2025). Public transfers, food consumption and dietary diversity. The case of Tarjeta Uruguay Social. *Food Policy, 132*, 102837. doi:https://doi.org/10.1016/j.foodpol.2025.102837

Ullah, Z., Nasir, A. R., Alqahtani, F. K., Ullah, F., Thaheem, M. J., & Maqsoom, A. (2023). Life Cycle Sustainability Assessment of Healthcare Buildings: A Policy Framework. *Buildings, 13*(9). doi:10.3390/buildings13092143

Ullah, Z., Thaheem, M. J., Waheed, A., & Maqsoom, A. (2019). Are LEED-certified healthcare buildings in the USA truly impacting sustainability? *Indoor and Built Environment, 29*(1), 7-23. doi:10.1177/1420326X19853324

Ullah, Z., Thaheem, M. J., Waheed, A., & Maqsoom, A. (2020, 2020//). *How Sustainability in Healthcare Sector Challenges Guidelines and Code Development: A Framework for Design of Sustainable Hospital Buildings.* Paper presented at the The 10th International Conference on Engineering, Project, and Production Management, Singapore.

Vey, T., Kinnicutt, E., Day, A. G., West, N., Sleeth, J., Nchimbi, K. B., & Yeates, K. (2025). Targeted Behavior Change Communication Using a Mobile Health Platform to Increase Uptake of Long-Lasting Insecticidal Nets Among Pregnant Women in Tanzania: Hati Salama "Secure Voucher" Study Cluster Randomized Controlled Trial. *Journal of Medical Internet Research, 27*. doi:https://doi.org/10.2196/51524

Vos, R., & Cattaneo, A. (2021). Poverty reduction through the development of inclusive food value chains. *Journal of Integrative Agriculture, 20*(4), 964-978. doi:https://doi.org/10.1016/S2095-3119(20)63398-6

Vujovic, A. N., Jonathan, G. M., & Hacks, S. (2024). Digitalisation and its Impact on Social Protection Programmes Effectiveness: A Case from South Africa. *Procedia Computer Science, 237*, 882-890. doi:https://doi.org/10.1016/j.procs.2024.05.177

Wang, J., Dong, J., & Lyu, W. (2026). Has the widespread use of electricity in household promoted higher women's subjective social status? Evidence from the China family panel studies. *Energy Policy, 208*, 114935. doi:https://doi.org/10.1016/j.enpol.2025.114935

Wegner, G. I., Murray, K. A., Springmann, M., Muller, A., Sokolow, S. H., Saylors, K., & Morens, D. M. (2022). Averting wildlife-borne infectious disease epidemics requires a focus on socio-ecological drivers and a redesign of the global food system. *eClinicalMedicine, 47*, 101386. doi:https://doi.org/10.1016/j.eclinm.2022.101386

Wray, R. (2020). Part B - The road to social progress. In R. Wray (Ed.), *A Great Leap Forward* (pp. 39-84): Academic Press.

Zang, Z., Tian, Q., & Wang, D. Z. W. (2025). On-demand transportation system for cross-state abortion travel: A dual dial-a-ride problem. *Transportation Research Part A: Policy and Practice, 196*, 104473. doi:https://doi.org/10.1016/j.tra.2025.104473