Do Economic Incentives Increase Attendance at Blood Drives: Experimental Evidence from Sierra Leone

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Abstract

We conducted a field experiment in Sierra Leone, West Africa, to examine the effects of incentives on attendance at community-level blood drives. The study evaluates interventions ranging from cash-like incentives to intrinsic incentives (a nudge emphasizing the importance of blood donation), and a neutral informational message about donation intervals.

Initially, communities were randomly assigned to one of four treatment arms: intrinsic motivation, a sit-down full meal, an 8-gigabyte mobile-phone data bundle, or a 20-gigabyte mobile-phone data bundle. Because the World Health Organization strongly discourages cash remuneration, we selected mobile-phone data bundles as a cash-like incentive. However, after observing that data bundles were being traded for cash at amounts below their face value, we created new treatment arms in previously untreated communities: a Le 30 (US$1.30) transportation payment, a Le 60 (US$2.60) transportation payment, or an intrinsic motivation message.

Relative to the two control arms, the meal incentive generated a modest increase in blood-donation attendance, mobile-data incentives produced larger increases, and transportation reimbursements (effectively, cash) produced still larger responses. Informational nudges, either positive ("this blood donation works") or normative (emphasizing that community blood donations save lives, especially those of mothers and infants),
did not affect attendance.

In short, the field experiment suggests that direct financial compensation may be necessary to increase blood donations to adequate levels in low-income countries such as Sierra Leone.

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1. Introduction

The World Health Organization (WHO) notes that in 2023, of the 118.5 million units of blood donated globally, 40 percent were collected in high-income countries, which account for only 16 percent of the world's population ("Blood Safety and Availability," n.d.). In Africa, blood donations are inadequate for transfusion and are a major challenge to healthcare provision (Asamoah-Akuoko et al. 2017). For instance, in 2020, 38 African countries experienced an aggregate shortfall of more than 3 million units of blood by the WHO's standards ("Status of Blood Availability, Safety and Quality in the WHO African Region," n.d.). Inadequate supplies of blood for transfusion are not only a problem in Africa but also in other low and middle-income countries. In this paper, we use randomized controlled trials to assess the effectiveness of various methods—intrinsic/social motivation, in-kind rewards, and cash-like rewards—in achieving greater blood donation attendance. We conduct field experiments in Sierra Leone, a resource-limited West African country in which blood donations are routinely inadequate.

For many years, blood donations have generated countervailing arguments within economics and public health. On the one hand, some researchers and policymakers have argued that blood donation should be based on *intrinsic motivation*. That is, they argue that blood donation should be purely voluntary and non-remunerated (World Health Organization and International Federation of Red Cross and Red Crescent Societies 2010; Singer 1973; Titmuss 1997). This argument is two-fold. They argue that, first, if donors are paid for their blood, then those who have blood disorders (anemia, insufficient platelets, insufficient clotting factors, low white blood cell count, polycythemia, etc.) or contaminated blood (blood-borne infections) may be induced to donate, making the blood pool dangerous or at a minimum—inefficient because much of it would need to be discarded after testing. Citing Titmuss, Singer notes that "…commercial systems tend to pick up a much higher percentage of irregular 'Skid Row' types than do voluntary systems" (pp. 313). Second, they argue that, because a blood donation benefits a person other than the donor, blood donations are inherently altruistic and that donors should therefore be motivated only by "warm glow." That is, donors should be motivated only by the emotional satisfaction and personal joy that they experience because they have done a good deed. This argument relies, to some extent, on the idea that *extrinsic* incentives for blood donation would debase the warm glow and ultimately repel high-quality donors. Thus, Singer (1973) notes that Titmuss's position rested on the premise that "[t]he laws of the marketplace

discourage altruism and fellow-feeling. …The supply of blood is outside the otherwise pervasive supermarket society" (pp. 314-16).

On the other hand, other researchers and policymakers have argued that it is reasonable for blood donation to generate *extrinsic rewards*. That is, they argue that donors should be remunerated with money or valuable in-kind transfers, such as on-site meals, groceries, or other valuable items (Lacetera et al. 2013; Arrow 1972). These commentators argue that blood, like labor and personal property, can appropriately and efficiently be exchanged in markets. Arrow (1972) argues that selling blood would simply expand the range of alternatives to existing voluntary systems. Arrow and other commentators argue, moreover, that market-based remuneration is the most practical way to equate the supply of blood with the demand for blood. In addition, recent scholars argue that concerns about unhealthy or contaminated blood are overstated, given the fact that blood services are now able to test blood immediately after donation, before it is released or processed for transfusion. They argue that the quality problem of the past was merely a function of information asymmetry between buyers and sellers. Inherently, if not explicitly, researchers and policymakers who are open to extrinsic rewards are also arguing that remuneration today does not repel future high-quality donors.

The debate about intrinsic versus extrinsic motivation has spilled over into actual policy. Specifically, the WHO sets its goal as achieving 100 percent voluntary, non-remunerated blood donation ("Blood Safety and Availability," n.d.; World Health Organization and International Federation of Red Cross and Red Crescent Societies 2010). The WHO does, however, countenance modest refreshment, small tokens of appreciation, and reimbursement of travel costs.

A potential problem with the larger debate and WHO guidance is that they are based mainly on evidence from high-income settings, such as Northern Europe and the United States (Goette et al. 2010; Mellström and Johannesson 2008; Lacetera et al. 2013). Lessons drawn from such evidence may apply poorly to settings where people are poor, hunger and undernourishment are common, and most workers are farmers or self-employed (so that donation cannot happen on the "time" of a large-scale employer), travel to the nearest donation site is time-consuming, and cash constraints are binding.

In particular, studies based on rich countries have features that are unlikely to be found in developing countries. In rich countries, donors often receive social rewards for donating blood –

for example, colleagues' approval of "prosocial" behavior or an "I donated" sticker – and may donate on an employer's time or university's campus, during work or school hours, donate in groups and therefore travel socially to the site, and suffer only very temporary discomfort and inconvenience. A disproportionate amount of the evidence is based on Scandinavian and Northern European societies that are notably homogeneous in race, ethnicity, and socioeconomics. In these societies, donors could reasonably conjecture that—even if they are donating anonymously—they are providing blood to a member of their extended family, to a neighbor, or to someone else whom they would meet socially.

These studies cannot necessarily be extrapolated to low-income countries such as Sierra Leone. In developing countries like Sierra Leone, Maslow's hierarchy of needs may apply (Maslow 1943). Maslow argues that individuals with very limited resources are primarily motivated by their immediate circumstances and tend to prioritize basic physiological needs such as food, water, and shelter.[2] If Maslow's theory holds, then the WHO's target of 100 percent voluntary, non-remunerated blood donation may consistently fail to achieve the WHO's competing target of an adequate blood supply.

A potential donor may be concerned that they will be temporarily incapacitated and unable to do the daily physical work that allows them to feed their family. They may have to get themselves to a blood donation site on their *own time* and at their *own expense*, not on their employer's time in a place to which they would have commuted anyway. Thus, giving blood in a prosocial way in Iceland may not be equivalent to giving blood in Sierra Leone. Titmuss's conceptualization of the altruistic gift emphasizes matching an anonymous donor to an anonymous recipient (Titmuss 1997). This conception may not hold well in Sierra Leone, where economic survival may depend on close family ties or social networks involving exchanges between known actors. Finally, potential donors may face psychic costs because needles may be

[2] Given substantial economic disparities across geographic locations ("Stiglitz, Joseph E., Adriana Abdenur, Winnie Byanyima, Jayati Ghosh, Imraan Valodia, and Wanga Zembe-Mkabile / G20 Extraordinary Committee of Independent Experts on Global Inequality... - Google Search," n.d.), divergences in immediate priorities and, therefore, willingness to donate blood, are not surprising. Consistent with Maslow's (1943) hierarchy of needs, individuals with very limited resources are primarily motivated by their immediate circumstances and tend to prioritize basic physiological needs such as food, water, and shelter. Maslow's model suggests that individuals with greater resources are more likely to pursue broader societal contributions as a form of self-actualization. Hence, due to broader societal constraints, many individuals in low-income settings may not elect to engage in a prosocial activity, such as blood donation.

associated with Western organizations and global pharmaceutical companies that have engaged in medical exploitation, poorly managed drug trials, or botched health campaigns.

In short, it is unclear from theory and logic whether intrinsic or extrinsic motivation is more effective in generating a sufficient supply of high-quality blood. Moreover, given that so much of the existing evidence is based on high-income countries, where most of the factors cited in the previous paragraph do not apply, it is unclear whether the evidence favors particular incentive regimes for blood donation.

The central question is therefore not simply whether incentives crowd out altruism. It is whether, and in what form, compensation relaxes the practical constraints that prevent otherwise willing individuals from attending a blood drive. Thus, we need models and parameter estimates that reflect this environment. It is therefore important to conduct field experiments in a setting like Sierra Leone.

This paper presents evidence from community-level randomized field experiments in Sierra Leone. It examines the effectiveness of cash-like incentives, in-kind incentives that can be sold on an informal market (mobile phone plans), meal incentives, intrinsic incentives that appeal to altruistic motives for donation, and purely informational messages (e.g., information about recommended donation intervals).

The noncash incentives were chosen because food and mobile-phone services are valued in low-income settings such as Sierra Leone. Mobile data can facilitate communication, education, business activity, and financial transactions. A full meal was envisioned because pre-experimental qualitative research highlighted food insecurity and the difficulty of donating blood without having eaten adequately.

During the implementation phase, some participants sought to convert in-kind transfers into cash, and many requested direct monetary compensation or transport reimbursement. These observations motivated a separate adaptive experiment in newly recruited communities. This adaptive experiment compared Le 30 and Le 60 transport reimbursements with a no-reimbursement control.

The broader research project combines randomized controlled trials with quantitative surveys and qualitative focus group discussions, which are reported elsewhere. The survey and focus group components informed the experimental design and provide context on barriers to blood donation in a low-income setting. The qualitative approach involves focus group

discussions with community members and healthcare practitioners to identify constraints to effective donor recruitment and to explore reasons for suboptimal blood collection across communities and subgroups. These focus group discussions also sought to unpack the role of belief systems and trust in the healthcare system in shaping blood donor behavior.

The survey component measures demographic, urban-rural, and socioeconomic differences in perceptions of blood donation, as well as the tradeoffs individuals make in lieu of donating blood. The survey also collects detailed information on motivators and deterrents to blood donation using Likert-scale measures (see Appendix A1 for survey methods).

The experiments show that economic incentives increased attendance at community blood drives. In the initial experiment, the full-meal incentive produced a modest increase in attendance, while both mobile-data incentives produced larger increases relative to the control group. In the adaptive reimbursement experiment, transport reimbursements produced substantially larger attendance responses. Pooled comparisons also suggest that cash reimbursement packages generated greater attendance than in-kind packages with similar stated monetary values. Informational nudges and messages did not produce a detectable increase in attendance in the current analysis.

These findings require careful interpretation. The primary outcome is attendance, not completed and screened blood donation. The results therefore speak to potential donor turnout rather than the final supply of safe blood units. The treatment packages also differed in more [3]than whether compensation was cash or in kind. They varied in timing, delivery flexibility, reliability, resale opportunities, and participants' subjective valuations. Monetary compensation was provided immediately as a lump-sum payment. Mobile-data compensation was distributed

[3] Curr Currie and Gahvari contend that economists generally view direct cash transfers as superior to in-kind benefits because the latter constrain recipients' choices (Currie and Gahvari 2008). They note that individuals concerned with the welfare of the poor may nevertheless prefer to restrict recipients' consumption choices to reduce potential negative externalities. They suggest that such policies are mainly explained through paternalism and interdependent preferences. However, restricting recipients' choices may erode the principle of consumer sovereignty (Besley 1988).

In standard welfare economics, direct monetary compensation is generally expected to maximize recipient welfare because it preserves consumer sovereignty, particularly where liquidity constraints are severe. In-kind transfers may nevertheless be preferred by policymakers when they seek to encourage consumption of particular goods or when they are concerned about how unrestricted cash will be used. In the context of blood donation, these issues take a different form. The objective is not primarily redistribution; it is to understand whether different forms of compensation affect willingness to bear the private costs of participating in a socially valuable health activity. Monetary compensation may or may not influence donor selection and, consequently, the safety of the blood supply.

over four months and was sometimes delayed because of delays in transfers by some network providers.

Behavioral economics suggests that people often have present-biased preferences and may discount future rewards hyperbolically rather than exponentially (Laibson 1997; Frederick et al. 2002; O'Donoghue and Rabin 1999). Individuals with time-inconsistent preferences may prefer a smaller immediate monetary reward to a larger reward received in the future. Our findings are consistent with present bias: participants may have valued immediate cash more highly than delayed, higher-value in-kind benefits. However, the compensation schemes differed in both timing and form. The results therefore cannot attribute the observed differences solely to present bias. Fungibility, perceived value, and the flexibility of cash may also have shaped participants' preferences.

This paper contributes to three literatures. First, it contributes to research on incentives and prosocial behavior. A longstanding literature debates whether external rewards undermine intrinsic motivation, reinforce participation, or have little net effect on prosocial actions (Titmuss 1997; Frey and Jegen 2001). Blood donation is an important setting for this debate because it creates social benefits while raising concerns about donor selection and blood safety.

Second, the paper contributes to the literature on blood donation incentives. Much of the existing evidence comes from high-income settings and evaluates small noncash benefits, donor recognition, health checks, lotteries, paid leave, and other recruitment strategies (Lacetera et al. 2012, 2013; Chell et al. 2018, 2022; Slonim et al. 2014). Experimental evidence on incentive design for blood donation in Sub-Saharan Africa remains limited.

Third, the paper contributes to the broader literature on cash and in-kind compensation in low-income settings. It provides evidence that the form of compensation may matter where potential donors face immediate financial constraints and substantial opportunity costs of participation.

The remainder of the paper proceeds as follows: Section 2 describes the institutional setting and presents the conceptual framework. Section 3 describes the research design, including the experimental interventions, randomization, outcomes, and empirical strategy. Section 4 presents descriptive evidence from the baseline survey. Section 5 presents the experimental results on noncash incentives, transport reimbursements, cash-versus in-kind comparisons,

attendee composition, repeat attendance, and informational messages. Section 6 discusses the findings, policy implications, limitations, and concludes.

2. Institutional Setting and Conceptual Framework

2.1 Blood Donation and Blood-System Constraints in Sierra Leone

[4] Sierra Leone's blood system operates in a context where the clinical need for transfusion is high and the supply of safe blood is limited. Blood and blood products are needed for obstetric hemorrhage, severe anemia, childhood illness, trauma, surgery, and hemoglobinopathies. However, blood availability depends not only on the number of people willing to donate but also on the availability of collection supplies, trained personnel, laboratory screening, storage, cold-chain capacity, distribution systems, and access to health facilities. This paper focuses on one component of that system: whether incentives increase at organized community blood drives. Additional information on the clinical demand for blood in Sierra Leone and other low-income countries is provided in (A2).

The National Safe Blood Services (NSBS) coordinates blood-transfusion activities through public and private transfusion facilities in Sierra Leone (National Safe Blood Services Sierra Leone 2023). Donated blood is screened for major transfusion-transmissible infections, including HIV, hepatitis B, hepatitis C, and syphilis, before clinical use. These procedures are

[4] Blood and blood products are required for a wide range of medical conditions, including obstetric hemorrhage, severe anemia, childhood illness, trauma, surgery, and hemoglobinopathies. Across low-income countries, children account for a large share of blood transfusions, while obstetric emergencies remain a major source of urgent need among women of reproductive age (Feng et al. 2023). In Sierra Leone, maternal mortality, childhood anemia, infectious disease, trauma, and chronic blood disorders create substantial clinical need for safe blood products (Shafiq et al. 2024; *Sierra Leone Demographic and Health Survey 2019 [FR365]*, n.d.).

It is important to distinguish among three related concepts. First, clinical need refers to the quantity of blood that would ideally be available for medically indicated transfusions. Second, demand or procurement activity refers to efforts by patients, families, communities, and medical institutions to locate or obtain blood. Third, available supply refers to units that are successfully collected, screened, stored, and made available for clinical use. These concepts need not move together. A patient may have substantial clinical need for blood but face limited ability to procure it. Likewise, a hospital may have nominal demand for blood but be unable to meet that demand because of shortages in collection supplies, staff, testing capacity, refrigeration, transport, or donor turnout.

The focus of this paper is narrower than the broader blood-system challenge. The experiment examines whether incentives increase attendance at blood drives, thereby relaxing one potential supply-side constraint: the number of people who present for screening and potential donation. The study does not imply that incentives alone can ensure adequate availability of safe blood. Greater donor turnout can improve collection only when it is accompanied by sufficient screening capacity, clinical staffing, storage, transportation, and distribution systems.

A fuller discussion of Sierra Leone's socioeconomic and health-system context, the clinical uses of blood, maternal hemorrhage, childhood anemia, hemoglobinopathies, trauma, and the broader evidence on blood-system constraints is provided in Appendix A2.

essential because blood safety depends not only on donor recruitment but also on screening capacity and the availability of appropriate collection and laboratory materials. Transfusion-transmissible infections remain a challenge to blood safety in many countries in Sub-Saharan Africa (Barro et al. 2018; Yambasu et al. 2018).

Sierra Leone formally relies on voluntary non-remunerated donation (VNRD) and family/replacement donation (FRD). Under WHO guidance, VNRD refers to donation without payment in cash or in kind that serves as a substitute for money. WHO guidance nevertheless permits modest refreshments and reimbursement of direct travel costs (World Health Organization and International Federation of Red Cross and Red Crescent Societies 2010). Family/replacement donation occurs when relatives, friends, or members of a social network donate in connection with the needs of a particular patient.

In practice, family/replacement donation remains important in Sierra Leone. During fieldwork, clinical staff, blood-bank personnel, and community members described circumstances in which patients' relatives were expected to identify replacement donors before blood could be released, except in emergencies. Participants also described informal payments and compensated arrangements around blood procurement. These accounts suggest that blood donation may be understood not only as anonymous altruism but also as a family obligation, an emergency response, and an activity embedded in household financial risk.

Why Attendance Is an Incomplete Outcome? The shortage of safe blood is not solely a donor-recruitment problem. Blood products have limited shelf lives, and successful collection requires blood bags, needles, testing kits, hemoglobin-testing materials, laboratory personnel, storage capacity, and transportation. During fieldwork, blood bank staff and healthcare workers reported recurrent shortages of these inputs. The research project therefore supplied supplementary blood bags and needles for use in some instances at the district-level. These materials were intended to reduce operational constraints during collection.

The primary outcome is blood-drive attendance: the number of individuals who register and present for screening with the intention of donating blood. Attendance is not equivalent to completed donation or to safe blood available for transfusion. Some attendees may be deferred because of low hemoglobin levels, health conditions, weight, recent donation, or other eligibility criteria. The policy relevance of attendance effects ultimately depends on completed donations,

deferrals, screening outcomes, storage, and distribution. These outcomes are examined where validated data are available.

2.2 Household Constraints and the Effective Cost of Donation

The private cost of attending a blood drive may be substantial even when blood is not formally priced. Potential donors may incur transportation expenses, lose time that could otherwise be used for household production, market production, or leisure, and face discomfort or recovery costs associated with blood donation. These costs may be particularly consequential when households have limited cash on hand and a limited ability to absorb a temporary reduction in work capacity.

Our qualitative work and baseline survey indicate that food insecurity, transportation costs, fear of needles, concerns about blood-test results, and uncertainty about donation locations are salient barriers to participation. Participants also emphasized the importance of meeting immediate household needs. Thus, an individual may recognize that blood donation saves lives and experience altruistic satisfaction from donating while also prioritizing food, income, or the needs of family members. In this setting, the relevant tradeoff is not necessarily between altruism and selfishness, but between helping an unknown blood recipient and protecting the immediate welfare of one's own household.

This context also makes the form of compensation important. A meal, a mobile-data bundle, and a transport reimbursement may each have value, but they do not offer the same flexibility. A meal can provide immediate nutritional value, but it cannot be used to pay for transportation, rent, school fees, debt, or other household expenses. A mobile-data bundle may support communication, business activity, education, and financial transactions, but its value depends on phone ownership, network coverage, data needs, timing of delivery, and delivery reliability. A cash reimbursement can be used flexibly and immediately, although it may also function as a more salient economic incentive than its reimbursement label suggests.

Much of the existing evidence on blood-donation incentives comes from high-income settings, where potential donors may face lower liquidity constraints, more stable incomes, greater access to paid leave or formal insurance, and lower costs of travel and recovery. The costs of in Sierra Leone may therefore include not only travel time and temporary physical

discomfort, but also concerns about reduced capacity for farm work, petty trading, motorcycle-taxi driving, household production, or other activities needed to secure daily necessities.

Family and community obligations and trust in the blood system may shape the attendance decision. Survey respondents who reported prior donation were much more likely to report having donated for a family member than at a general blood drive. Potential donors may therefore value helping an unknown future recipient while giving greater priority to protecting the welfare of family members who depend on the donor's income, food, labor, or care. In addition, uncertainty about whether donated blood will be collected, screened, stored, transported, and used as intended may lower the perceived social return to anonymous donation. Additional details on Sierra Leone's socioeconomic profile are provided in Appendix A3.

2.3 Conceptual Framework and Predictions

Intrinsic and Extrinsic Motivation

Blood donation is a prosocial activity: it imposes private costs on the donor while potentially benefiting patients and the broader community. A longstanding literature examines whether external rewards strengthen participation in prosocial activities or undermine intrinsic motivations, such as altruism, civic duty, and warm glow. Titmuss argued that commercializing blood donation could weaken the social norms supporting voluntary donation and create risks for blood safety (Titmuss 1997). Subsequent work emphasizes that the effect of external rewards is theoretically ambiguous. Compensation may crowd out intrinsic motivation if it changes the social meaning of donation or is perceived as controlling. Alternatively, compensation may crowd in participation when it is understood as recognition, support, or compensation for the costs of action (Frey 1997; Frey and Jegen 2001).

The blood-donation literature similarly finds that the effect of incentives depends on the form, size, timing, and framing of the benefit, as well as on the characteristics of potential donors and the institutional environment. Existing studies examine refreshments, donor recognition, health checks, lottery tickets, paid leave, travel reimbursements, discounted event tickets, and other noncash rewards (Glynn et al. 2003; Sanchez et al. 2001; Lacetera et al. 2012; Chmielewski et al. 2012; Lacetera et al. 2013). This literature does not uniformly support the prediction that modest incentives eliminate altruistic participation.

A standard interpretation of this literature is that a potential donor compares the intrinsic benefits of donating with the private costs of participation. In higher-income settings, those private costs may consist primarily of time, travel, inconvenience, and temporary physical discomfort. Potential donors may be able to take time away from formal employment, retain income while away from work, access adequate food and rest after donation, and travel reliably to an organized blood drive. Under these conditions, relatively modest recognition or compensation may be sufficient to influence a donation decision.

A Conceptual Framework for Blood Drive Attendance In Low-income Settings

An individual attends a blood drive when the net perceived payoff from attendance is nonnegative. The net perceived payoff from attendance can be written conceptually as:

$$V_i(\text{attend}) = A_i + S_i + R_i(Z) - C_i^{\text{time}} - C_i^{\text{transport}} - C_i^{\text{physical}} - C_i^{\text{household}} - C_i^{\text{uncertainty}}$$

The individual attends when:

$$\text{Attend}_i = 1 \quad \text{if} \quad V_i(\text{attend}) - V_i(\text{not attend}) \geq 0,$$

For expositional convenience, $V_i(\text{not attend})$ is normalized to zero. This expression is not a structural utility function and is not estimated in the empirical analysis. Rather, it is a reduced-form conceptual framework that summarizes the perceived private benefits and costs that may shape the attendance decision.

In the expression, A_i captures the perceived altruistic benefits from helping a patient or contributing to the community. S_i captures warm glow, social approval, civic duty, personal satisfaction, and other intrinsic or social benefits associated with donation. $R_i(Z)$ represents the perceived value of an incentive package Z. The cost terms capture time costs, transportation costs, physical discomfort or recovery costs, forgone income or household labor, and uncertainty about eligibility, test results, privacy, and whether donated blood will be collected and used as intended.

The framework emphasizes that low attendance need not reflect an absence of altruism. In Sierra Leone, potential donors may face large transportation costs, liquidity constraints, food insecurity, opportunity costs, and household constraints. A person may value helping an

unknown recipient but still decline to attend if the expected private cost of attendance is high relative to the perceived benefit.

This framework motivates, but does not itself estimate, three predictions. First, incentive packages that increase the effective private return to attendance should increase turnout. Second, larger or more highly valued packages may generate larger attendance responses, although program cost need not equal participants' subjective valuation. Third, conditional on stated value, immediate and flexible transport reimbursement may generate a larger attendance response than a meal or mobile-data package if donors value liquidity, flexibility, certainty, and immediate use.

The framework does not determine whether any incentive package maximizes social welfare. A welfare assessment would additionally require evidence on completed donations, donor health, infection-screening outcomes, usable blood units, program costs, potential displacement from other blood drives, and any longer-run effects on voluntary donation norms. The present analysis therefore focuses on the causal effect of the tested incentive packages on blood-drive attendance. The experimental treatments are motivated by this separately framework, but empirical analysis does not estimate its underlying components or separately identify its mechanisms.

Hypotheses

Hypothesis 1: Economic incentive packages increase attendance at community blood drives relative to standard light refreshments.

Hypothesis 2**:** Larger incentive packages generate higher attendance, although the relationship between stated value and attendance need not be linear because donors may value different goods differently.

Hypothesis 3**:** Conditional on stated monetary value, transport-reimbursement packages generate higher attendance than in-kind packages when donors value flexibility, immediacy, and reliability.

This framework motivates the treatment comparisons examined in the experiments. Experiment 1 tests whether a full meal and mobile-data bundles increase attendance relative to standard refreshments and baseline information. After implementation observations suggested that

participants valued more immediate and flexible compensation, Experiment 2 separately randomized transport-reimbursement packages in newly recruited communities. This empirical analysis estimates the causal effects of these packages on attendance; it does not estimate the underlying components of the conceptual framework.

2.4. Information Messages and Repeat Attendance

The study also examines whether informational messages affect subsequent participation among individuals who previously attended a blood drive. Information campaigns are frequently used in donor-recruitment efforts to increase awareness of blood shortages, correct misconceptions, make the social benefits of donation more salient, and encourage repeat donation. In the present study, the informational treatments consisted of messages emphasizing either the number of potential beneficiaries of a donation or a narrative describing a patient whose life was saved through voluntary blood donation.

***Hypothesis 4*:** Informational messages emphasizing the social value of blood donation may increase repeat attendance if low participation reflects limited awareness or insufficient salience of the benefits of donation. However, such messages may have limited effects when the primary barriers are immediate economic, physical, or household constraints.

The informational treatments were assigned at the district level and delivered through multiple channels, including in-person reminders, WhatsApp groups, SMS, and public postings. Because treatment delivery was imperfect and the number of districts was limited, the information analysis should be interpreted as exploratory. The relevant estimand is the intention-to-treat effect of assignment to an information environment, rather than the effect of personally receiving, reading, or recalling a particular message.

The analysis also considers whether the initial incentive through which individuals entered the donor pool affected their subsequent responsiveness to informational messages. Initial incentives may influence return behavior through several channels: they may alter the donor's experience of the blood drive, shape expectations about future compensation, affect trust in the organizers, or change the social meaning attached to participation. The resulting evidence is necessarily suggestive, but it contributes to the broader question of whether extrinsic

incentives and prosocial information operate as substitutes, complements, or independent influences on repeated participation.

Part II. Research Design and Data

3. Research Design

3.1 Study Setting, Timeline, and Registration

The experimental component of the study evaluates whether incentives packages increase attendance at community blood drives in Sierra Leone. The design includes three related components:

1. An initial community-level randomized experiment testing noncash incentives;
2. A district-level information intervention examining repeat attendance among individuals who previously attended an experimental blood drive; and
3. An adaptive, separately randomized transport-reimbursement experiment introduced after implementation of the initial experiment.

The study was conducted in 10 districts spanning Sierra Leone's 4 provinces. The interventions were informed by a baseline survey and pre-experimental focus group discussions with community members, healthcare workers, blood bank personnel, and other local stakeholders. The mixed-methods design was used to identify salient barriers to participation and select locally meaningful and operationally feasible interventions. Random assignment provides the basis for causal inference regarding the effects of the incentive packages on blood-drive attendance.

The primary analyses are an intention-to-treat analyses. They estimate the effect of assignment to an incentive condition on attendance at the associated blood drive, regardless of whether every intended participant received, understood, or used the assigned intervention. For the information intervention, the relevant estimand is the effect of assignment to a district-level information environment, rather than the effect of personally receiving, reading, or recalling a particular message.

Table 1. Study Timeline

Study period	Activity	Main purpose
Late 2024-Early 2025	Baseline survey and focus group discussions	Document barriers, motivations, and local

		context; inform treatment design
April 2025 onward	Experiment 1: community-level noncash incentive experiment	Test effects of meals and mobile-date bundles on blood-drive attendance
Ramadan period, February-March 2026	Information intervention and repeat-attendance follow-up	Test whether assignment to an information environment affects return attendance
Following implementation observations from Experiment 1	Adaptive Experiment 2: transport reimbursement	Test the effects of transport-reimbursements packages in newly recruited communities

Note: The baseline survey and focus group discussions informed the initial intervention design. Experiment 2 was introduced after implementation observations from Experiment 1 and was separately randomized in newly recruited communities. The timeline describes the sequence of study activities; it does not imply that Experiment 2 was a pre-specified arm of Experiment 1.

Stanford Institutional Review Board (Protocol 75994) and Sierra Leone Ethics and Scientific Review Committee (SLESRC No. 12/06/2024) approved the study. The study is registered in the AEA RCT (AEARCTR-00193334); https://www.socialscienceregistry.org/trials/19334). The registry entry was submitted on August 31, 2026, after implementation of the initial experiment had begun. The registry documents the study and its experimental components, but it should not be interpreted as a prospective pre-analysis plan for analyses completed before registration.

3.2 Experiment 1: Noncash Incentives

Experiment 1 tested whether noncash packages addressing salient needs in the study setting, a full meal and mobile-date dandles, would increase blood-drive attendance relative to standard light refreshments. The meal intervention was motivated by qualitative evidence linking food insecurity to reluctance to donate. Mobile-data bundles were selected because mobile-phone services have practical value for communication, business activity, education, financial transactions, and other daily activities.

Communities were randomly assigned to one of four conditions:

1. Control: Standard blood-donation information and standard light refreshments.
2. Meal incentive: A full sit-down meal and drink.
3. 8 GB mobile-data incentive: 2 GB of mobile-phone data per month for four months.
4. 20 GB mobile-data incentive: 5 GB of mobile-phone data per month for four months.

The primary outcome is attendance, defined as presenting at the blood drive, registering, and completing initial eligibility screening. Individuals who presented for screening but were deferred, for example, because of low hemoglobin or prior test results that precluded donation, were coded as attendees. Deferred individuals received standard refreshments and, in the meal arm the assigned meal. However, mobile-data bundles were offered only to individuals who completed donation, subject to standard eligibility screening.

All participants received standard light refreshments after the blood drive, except those assigned to the full-meal arm, who received the sit-down meal and drink. The mobile-data packages were designed to provide benefits over four months, broadly corresponding to blood-donation eligibility intervals: men are generally eligible to donate every three months and women every four months in Sierra Leone. The packages were therefore intended to provide value beyond the day of the blood drive.

The meal arm was motivated by focus-group discussions and survey evidence indicating that food insecurity and concerns about donating without adequate food were salient barriers to participation. The intervention does not test the effect of improving household food security more generally. Rather, it tests whether offering a full meal at the blood drive increases attendance relative to standard light refreshments.

The stated values of the initial noncash incentives were approximately Le 60 for the meal, Le 160 for the 8 GB data package, and Le 400 for the 20 GB data package. These values are based on the research team's cost of providing the packages and should not be interpreted as measures of participant's subjective valuations.

Mobile-data bundles were delivered through the country's three major mobile-network providers: Africell, Orange, and Qcell. Following each blood drive, the research team transmitted the mobile-phone numbers of eligible donor participants to the relevant provider for data transfer. Africell and Qcell generally completed transfers within approximately two to three business days. Transfers to Orange subscribers experienced more frequent delays. Participants were informed of these delays and, when they had access to multiple SIM cards, were encouraged to provide a non-Orange number for data transfer.

The study also allocated supplementary blood bags to blood banks for use at some district level blood drives. This component responded to reports from focus groups and healthcare workers that willing donors could not always donate when collection sites lacked basic materials.

The supplementary materials were intended to reduce supply-side operational constraints during collection.

3.3 Adaptive Experiment 2: Transport Reimbursement

The adaptive transport-reimbursement experiment was introduced after implementation of the initial noncash experiment revealed that stated program values and participants' effective valuations were not necessarily equivalent. Some participants attempted to exchange mobile-data bundles for cash by providing alternative cellphone numbers. Some participants in the meal arm requested lower-cost food options and asked to receive the remaining balance in cash. Participants across treatment groups also frequently requested direct cash compensation or transport reimbursement. These observations do not identify a single mechanism, but they suggest that potential donors may value flexibility, immediacy, and the ability to use compensation for different household needs.

These implementation observations motivated a separately randomized experiment in newly recruited communities. The adaptive experiment (Experiment 2) included three additional communities per district. Communities were randomly assigned to one of three conditions:

1. Control: No transport reimbursement; standard light refreshment.
2. Le 30 reimbursement: A Le 30 payment framed as transport reimbursement, plus standard light refreshment.
3. Le 60 reimbursement: A Le 60 payment framed as transport reimbursement, plus standard light refreshment.

Transport reimbursements were offered only to individuals who completed donation after standard eligibility screening. Individuals who presented for screening but were deferred were nevertheless counted as attendees in the primary outcome and received standard light refreshments.

Participants in the transport-reimbursement experiment received standard information about blood-donation eligibility and light refreshment. They did not receive the statistical-beneficiary or narrative-beneficiary messages used in the information intervention.

The payments were framed as reimbursement for transportation costs. However, transport costs varied across potential donors, and the payments may have exceeded actual travel expenses

for many participants. Because blood drives were held within local communities, some potential donors could attend by walking short distances. The intervention should therefore be interpreted as a transport-reimbursement package that may have both reduce participation costs and provided a salient monetary incentive.

Because Experiment 2 was introduced after Experiment 1 and implemented in distinct, newly recruited communities, it should be interpreted as an adaptive parallel experiment rather than as a pre-specified treatment arm of the original noncash experiment. The experiment estimates the causal effects of the reimbursement packages on blood-drive attendance, but it does not separately identify the roles of cash, timing, salience, flexibility, or delivery reliability.

3.4 Information Messages and Repeat Attendance

In addition to the community-level incentive assignments, districts were assigned to one of three information environments:

1. Baseline information: Standard information about blood-donation eligibility intervals.
2. Statistical-beneficiary message: A message emphasizing that one blood donation could potentially benefit three people.
3. Narrative beneficiary message: A message describing a patient in urgent need of blood and emphasizing the potential lifesaving consequences of donation.

The messages were delivered in English and Krio through in-person communication, WhatsApp groups, SMS messages, public postings, and reminders. The information intervention was designed to test whether emphasizing the social value of blood donation affects subsequent participation, particularly among individuals who had previously attended an experimental blood drive.

The research team used the Ramadan period as a communication and follow-up period. Blood donation activity is lower during Ramadan because a substantial share of the population fasts during daylight hours. Rather than conduct active blood drives during this period, the research team maintained contact with participants in information-assigned districts and disseminated the relevant messages. Participants in baseline-information districts received neutral information about donation-eligibility intervals.

Information delivery was incomplete. Blood drives were relatively short, typically lasting three to four hours, and not every participant necessarily received or attended to a message. The information analysis therefore estimates the intention-to-treat effect of district-level assignment to an information environment. It does not estimate the effect of personally receiving, reading, or recalling a particular message.

3.5 Randomization, Recruitment, and Implementation

Study Sites, Community Engagement, and Recruitment

The experiment was implemented in 10 districts: Bo, Bombali, Kambia, Kenama, Koinadugu, Kono, Moyamba, Port Loko, Western Rural Area, and Western Urban Area. The geographic scope was intended to capture variation in population density, access to health facilities, local economic conditions, and prior exposure to blood donation campaigns.

Before blood drives were held, the research team conducted community-engagement visits and informed residents about upcoming blood donation opportunities. Recruitment occurred through community meetings, flyers posted in public locations, town criers, local leaders, WhatsApp groups, text messages, and direct reminders. Flyers and announcements described the date and location of the blood drive and, where relevant, the incentive associated with the community's assignment.

For example, when a community was assigned to the 20 GB mobile-data bundle arm, the research team visited the community one to two days before the blood drive to announce the upcoming drive and the incentive offered to individuals who completed donation, subject to standard eligibility screening. On the day of the blood drive, consenting participants provided demographic information to the research team, while blood bank personnel collected standard donor information. The research team collected cellphone numbers, which were transmitted to cellphone network providers for participants who completed donation in the mobile-data treatment arms.

Where feasible, the study team created WhatsApp groups for participating communities. Many donor participants owned Android phones and used WhatsApp, although access to smartphones, internet connectivity, and WhatsApp was not universal. WhatsApp communication therefore supplemented, rather than replaced, in-person recruitment, public announcements, and other channels.

All potential participants were screened according to the eligibility requirements of the National Safe Blood Service. Individuals under age 18 were not eligible. Potential donors were also screened for relevant health conditions and other criteria specified by the blood service. Hemoglobin levels were measured before donation, and individuals with hemoglobin levels below 11 g/dL were temporarily deferred. Individuals who were deferred could return during a subsequent visit if they later met the relevant eligibility criteria.

All Participants were informed about the research and had the opportunity to provide written or verbal informed consent.

Randomization

The primary unit of randomization for the incentive experiments was the community. This choice reflects the operational reality that blood drives recruit groups of potential donors within a community at a given time and location. Randomizing individuals within the same community would have been difficult because participants could observe one another's treatment status, exchange information, or perceive unequal treatment at a shared blood drive.

For Experiment 1, communities within each district were assigned to one of four conditions: control, full meal, 8 GB mobile-data bundle, or 20 GB mobile-data bundle. For Experiment 2, three additional communities per district were assigned to one of three conditions: no reimbursement, the Le 30 transport reimbursement, or Le 60 transport reimbursement. The Experiment 2 communities were distinct from those participating in Experiment 1.

Community and district assignment was conducted jointly by the principal investigator and research partners, including blood bank personnel. Community and district names were written on paper and drawn from a container to determine treatment assignment. The process was conducted in the presence of relevant implementing partners. This procedure was used to assign communities to incentive conditions and districts to information environments.

The information intervention differed from the incentive experiments because it was assigned at the district level. Each district was assigned to one of the three information environments: baseline, statistical-beneficiary, or narrative-beneficiary information. This design permits the study of district-level communication strategies but yielded a limited number of information-treatment assignment units. The information results should therefore be interpreted as exploratory, and inference accounts for the small number of districts.

Table 2: Experimental Assignment and Analysis Samples

Experiment	Assignment level	Treatment conditions	Communities assigned	Communities in current main analysis	Primary Outcome
Experiment 1: Noncash incentives	Community	Control; full meal; 8 GB data; 20 GB	40 communities	32 completed first-round communities; 28 in the main specification excluding Bombali	Blood-drive attendance
Information and repeat attendance	District	Baseline; statistical-beneficiary; Narrative-beneficiary	10 districts	4 districts; 16 communities; 245 verified initial attendees with completed follow-up	Return attendance
Experiment 2: Transport reimbursement	Community	N reimbursement;, Le 30, Le 60	30 communities	15 communities in five districts that completed all three treatment arms	blood drive attendance

Notes: Experiment 1 and Experiment 2 were randomized at the community level. The information intervention was randomized at the district level. Experiment 1 main attendance specification excludes the four Bombali communities because the control community was substantively atypical; estimates including Bombali are reported separately. Bombali is retained in analyses for which exclusion is not relevant or where the full sample is reported. Experiment

2 was introduced after implementation of Experiment 1 and was conducted in newly recruited communities. The Experiment 2 results are preliminary because field work was ongoing at the time of analysis.

3.6 Outcomes and Empirical Strategy

Outcomes

The primary outcome is community-level blood drive attendance. For each community-level treatment assignment, attendance is measured as the number of individuals who present at the blood drive, register, and complete initial eligibility screening.

The focus on attendance reflects the intention-to-treat objective of the initial analysis: whether assignment to an incentive package increases the number of people who present for potential donation. Attendance is not equivalent to completed donation. Some individuals may be deferred because they do not meet hemoglobin, health, weight, recent-donation, or other eligibility criteria. Others may be screened but not complete the donation process for operational or personal reasons.

The study also examines several secondary outcomes:

1. Attendee composition: prior donation history, age, sex, monthly income, education, occupation, meals consumed per day;
2. Repeat attendance: whether individuals who attended an initial blood drive return for a subsequent blood drive;
3. Completed donation: the number or share of attendees who successfully complete donation;
4. Deferrals and eligibility: whether individuals are deferred at screening and the stated reason for deferral;
5. Blood-test outcomes: screening results relevant to blood safety by treatment arm.

The current draft analyses attendance, attendee composition, and repeat attendance. Analyses of completed donation, deferrals, and blood-test outcomes will be incorporated when validated data are available.

Experiment 1: Effects of Noncash Incentives

The primary analysis of Experiment 1 estimates the intention-to-treat effect of assignments to each noncash incentive package on community-level drive attendance:

$$Attendance_c = \alpha + \beta_1 Meal_c + \beta_2 Data8_c + \beta_3 Data20_c + \delta_d + \varepsilon_c,$$

Where $Attendance_c$ is the number of individuals attending the blood drive in community c; $Meal_c$, $Data8_c$ and $Data20_c$ are indicators for assignment to the full meal, 8 GB data, and 20 GB data mobile-data conditions; δ_d denotes district fixed effects; and ε_c is an error term. The omitted category is the control condition.

The coefficients β_1, β_2, and β_3 capture differences in mean community-level attendance between each incentive arm and the control arm, conditional on district fixed effects. Because treatment was assigned at the community level and the number of communities is limited, inference should use randomization-based inference or other small-sample methods that reflect the original assignment mechanism.

The study also estimates a continuous incentive-value specification:

$$Attendance_c = \alpha + \beta Value_c + \delta_d + \varepsilon_c,$$

Where $Value_c$ is the stated Leone value of the assigned noncash incentive. This specification summarizes whether attendance rises with the stated value of the package. It should not be interpreted as identifying a structural marginal effect of incentive value because the packages differ in content and stated value may differ from participants' valuations.

Attendee composition in Experiment 1

To examine whether noncash incentives attracted attendees with different observable characteristics, the paper estimates:

$$X_{ic} = \alpha + \beta_1 Meal_c + \beta_2 Data8_c + \beta_3 Data20_c + \delta_d + \varepsilon_{ic},$$

Where X_{ic} is a characteristic of attendee *i* in community c, such as prior donation history, age, sex, monthly income, education, occupation, or meals consumed per day.

These regressions do not estimate the effects of incentives on the characteristics of a fixed population because the individuals observed in the treatment and control communities are different attendees. Instead, they test whether the composition of attendees differs across

randomly assigned incentive environments. Inference should account for community-level treatment assignment.

Repeat Attendance and Information Assignment

The repeat-attendance analysis examines whether individuals who attended an initial blood drive returned for a subsequent donation opportunity. The baseline specification is:

$$\text{Return}_i = \alpha + \beta_1 \text{Statistical}_d + \beta_2 \text{Narrative}_d + \beta_3 \text{Meal}_c + \beta_4 \text{Data8}_c + \beta_5 \text{Data20}_c + X_i'\theta + \varepsilon_i.$$

Where $Return_i$ equals one if individual i was verified to have returned for a subsequent experimental blood drive. $Statistical_d$ and $Narrative_d$ indicate district-level information assignment; while the incentive indicators capture the individual's initial community-level assignment. X_i includes pre-treatment characteristics where available.

The omitted information category is the baseline information, and the omitted incentive category is the initial control condition. The information treatment was assigned at the district, whereas the initial incentive treatment was assigned at the community level. Because only 10 districts were randomized, and only a subset had completed follow-up at the time of analysis, the information results are exploratory. The primary inference uses randomization inference based on the original district-level assignment mechanism.

Experiment 2: Effects of Transport Reimbursements

The primary specification for the adaptive transport reimbursement experiment is:

$$Attendance_c = \alpha + \beta_1 Le30_c + \beta_2 Le60_c + \delta_d + \varepsilon_c,$$

Where $Le30_c$ and $Le60_c$ indicate assignment to the Le 30 and Le 60 transport-reimbursement conditions, respectively. The omitted category is the no-reimbursement control group. The coefficients capture the intention-to-treat effects of community assignment to each reimbursement package on blood-drive attendance.

The analysis includes district fixed effects because communities were assigned within districts. The current results use the five districts that completed all three Experiment 2 treatment arms. Because the broader Experiment 2 rollout remains ongoing, the results are preliminary.

To examine whether reimbursement attracted attendees with different observable characteristics, the paper estimates:

$$X_{ic} = \alpha + \beta_1 Le30_c + \beta_2 Le60_c + \delta_d + \varepsilon_{ic},$$

Where X_{ic} represents characteristics of attendee i community c. As in Experiment 1, these estimates describe whether treatment assignment changed the observed composition of individuals who attended blood drives; they do not estimate changes in the characteristics of a fixed set of individuals.

Pooled Comparison of Cash and In-kind incentive Packages

The pooled analysis combines community-level observations from the noncash and transport-reimbursement experiments to summarize the relationship between attendance, the stated value of the incentive package, and the form of compensation:

$$Attendance_c = \alpha + \beta_1 Value_c + \beta_2 Cash_c + \gamma Experiment2_c + \delta_d + \varepsilon_c.$$

Here $Cash_c$ equals one for communities assigned to a transport-reimbursement treatment and zero for communities assigned to a noncash incentive treatment. $Value_c$ is the stated Leone value of the assigned package, and $Experiment2_c$ indicates whether the observation comes from the adaptive transport-reimbursement experiment.

A more flexible specification allows the relationship between stated incentive value and attendance to differ between cash and in-kind packages:

$$Attendance_c = \alpha + \beta_1 Value_c + \beta_2 Cash_c + \beta_3 (Value_c \times Cash_c) + \gamma Experiment2_c + \delta_d + \varepsilon_c.$$

In the interaction specification, the coefficient on $Cash_c$ represents the estimated difference in attendance between cash and in-kind packages when stated incentive value equals zero. Because this comparison is substantively meaningful, the analysis presents predicted attendance or marginal effects at observed incentive value. The interaction coefficient tests whether the relationship between stated incentive value and attendance differs between cash and in-kind packages.

The pooled regressions summarize patterns across the incentive packages tested in the study, but they do not identify the causal effect of cash fungibility alone. The cash and in-kind packages differed in timing, delivery procedures, salience, reliability, transferability, and likely

subjective value. In addition, the transport-reimbursement experiment was introduced adaptively and implemented in newly recruited communities. The pooled analysis should therefore be interpreted as a comparison of the overall incentive packages as implemented, rather than as a test that holds all features of the cash and in-kind treatments constant.

3.7 Threats to Validity and Interpretation

Spillovers and Interference

The stable unit treatment value assumption may be difficult to satisfy fully in this setting. Community members may communicate with individuals in nearby communities about incentives offered at blood drives. Potential donors may also travel across community boundaries or attend blood drives outside of their assigned community. Such spillovers could attenuate differences across treatment arms if individuals in control-group communities learn about, or attempt to access incentives offered elsewhere.

Several design features reduce, but do not eliminate, this concern. Blood drives were organized around geographically defined communities, recruitment was conducted locally, and incentives were communicated in connection with particular community blood drives. Communities were often separated by substantial distances, and participants were asked about the date and location of their most recent blood donation. In some cases, multiple blood drives within a district were conducted on the same day, reducing the opportunity for individuals to attend more than one drive. Nevertheless, some cross-community information sharing and movement may have occurred.

Treatment Compliance and Delivery

The incentive analyses estimate intention-to-treat effects because implementation was imperfect. Mobile-data bundles were sometimes delayed, particularly for Orange subscribers. Some participants used multiple cellphone numbers, and informal exchanges emerged around data transfers. Meal delivery also faced implementation challenges, including uncertainty regarding the number of expected participants and variation in meal prices across communities.

These implementation issues are substantively informative: they reveal that the effective value of an in-kind incentive depends on whether it can be delivered reliably and used as intended. At the same time, they mean that the estimates should be interpreted as the effect of

assignment to the meal or mobile-data package as implemented, rather than the effects of receiving a perfectly delivered in-kind transfer.

External Validity

The study covers 10 districts across Sierra Leone's four provinces and includes urban, peri-urban, and rural communities. This geographic breadth improves the relevance of the findings within Sierra Leone. However, the results may not generalize directly to other donor populations, economic conditions, or regulations governing donor compensation. donors or countries with different blood service systems and economic conditions.

The setting is particularly relevant to low-income contexts in which potential donors face meaningful transport costs, irregular income, food insecurity, and limited access to formal financial services. The relative effectiveness of cash and in-kind incentives may differ in settings with stronger voluntary-donation cultures, lower opportunity costs of attendance, more reliable blood service infrastructure, or different regulations regarding donor compensation.

Bombali District

The main Experiment 1 attendance specification excludes the four communities in Bambali District because the control community differed substantially from the community-based recruitment environments used elsewhere. The Bombali control group included Sierra Leone Red Cross volunteers and university students in clinical laboratory science and related life science fields. These groups had unusually high pre-existing exposure to volunteerism, health-service activities, and blood donation.

The exclusion is based on concerns about the substantive comparability of the Bombali control community. Appendix Table A1reports Experiment 1 estimates including Bombali. The overall pattern of results remains positive when Bombali is included, although estimated effects are attenuated.

Experiment 2 results are reported both including Bombali and excluding Bombali as a robustness check. Because the Experiment 2 sample is preliminary and includes only five districts with completed treatment arms, these comparisons should be interpreted cautiously.

Section 4. Baseline Survey and Descriptive Evidence

Before implementing the experimental component of this project, we conducted a cross-sectional survey of adults in selected districts of Sierra Leone to describe prior blood donation

experiences, beliefs, perceived barriers, and attitudes toward compensation. The survey was designed to provide descriptive evidence on blood-donation practices and to inform the local design of the experimental incentives.

The survey compares respondents with and without prior blood-donation experience across demographic, household, socioeconomic, and attitudinal characteristics. It also documents reported donation history, perceived barriers, motivations, and attitudes toward compensation. All perception, motivation, and barrier items used in the descriptive comparisons were administered to both respondents with and without prior blood-donation experience using the same five-point Likert scale. The resulting estimates should be interpreted as descriptive associations between reported donation history and stated attitudes, rather than as causal determinants of donation. Together with focus group discussions conducted with community members and healthcare workers, these descriptive findings informed the selection and local adaptation of the experimental interventions.

The survey is not intended to provide causal estimates of the determinants of blood donation, nor is it a nationally representative household survey. Rather, it provides descriptive evidence from adults in 10 districts spanning Sierra Leone's four provinces. The findings help characterize the broader population from which potential donors were recruited and identify barriers that may plausibly affect willingness to attend a blood drive. The experiment, by contrast, uses randomized assignment to estimate the causal effects of incentive packages on blood-drive attendance.

4.1 Survey Design and Sample

The in-person baseline survey was conducted between late 2024 and early 2025, before recruitment for the experimental blood drives began. The research team initially recruited approximately 1,500 adults aged 18 years and older using a multistage district-level sampling approach. Data collection covered 10 of Sierra Leone's 16 districts: Bo, Bombali, Kambia, Kenema, Koinadugu, Kono, Moyamba, Port Loko, Western Rural Area, and Western Urban Area. Together, these districts span the Northern, North-Western, Southern, and Eastern Provinces.

Within districts, enumerators conducted interviews in public spaces using a structured random-walk procedure. Enumerators approached passersby at predetermined intervals to reduce

discretionary respondent selection. Participants received Le 20, approximately US$0.85 at the time of the study, as compensation for their time. The survey collected information on demographic characteristics, education, employment, household composition, income, housing, religion, access to services and technology, prior blood donation experience, perceptions of blood donation, stated motivations, perceived barriers, and attitudes toward compensation.

The principal investigator conducted random back-checks of the completed questionnaires to assess adherence to field protocols and data quality. These checks identified concerns regarding the surveys collected in Moyamba District; all Moyamba observations were therefore excluded from the survey analysis. The number of observations varies across outcomes because of item nonresponse and missing covariate information. Appendix A1 provides further information on survey administration, questionnaire design, data cleaning, variable construction, and the full survey instrument.

4.2 Characteristics of Prior Donors and Non-Donors

Table 1 compares respondents who reported having previously donated blood with those who reported no prior donation. These differences are descriptive and should not be interpreted as causal effects.

Table 3. Characteristics of Respondents With and Without Prior Blood-Donation Experience

Variable	No Prior Donation	Prior Donation	Difference	Robust SE	N
Age (years)	29.287	32.832	3.545***	0.754	1,009
Female	0.578	0.387	-0.191***	0.035	1,013
Has children	0.534	0.786	0.252***	0.031	1,009
Married	0.330	0.529	0.199***	0.035	1,013
Technical/vocational education	0.096	0.151	0.055**	0.024	999
Bachelor's degree	0.223	0.218	-0.005	0.029	999
Formally employed	0.110	0.188	0.078***	0.026	992
Self-employed	0.324	0.463	0.140***	0.035	992
Student	0.383	0.221	-0.163***	0.031	992
Muslim	0.592	0.661	0.070**	0.035	952

Notes: This table reports mean characteristics by self-reported prior blood-donation status. The difference column is estimated from a regression of each characteristic on an indicator for prior blood-donation experience. Robust standard errors are reported. Binary variables are reported as proportions. The number of observations varies across

characteristics because of item nonresponse. These differences are descriptive and should not be interpreted causally. $* p < 0.10,\ ** p < 0.05,\ *** p < 0.01$

Several descriptive patterns are notable. Respondents reporting prior donation were older, on average, than respondents with no prior donation and were substantially more likely to be male. Prior donors were also more likely to have children and be married. They were more likely to report formal, informal, or self-employment, whereas respondents with no prior donation were more likely to be students or unemployed.

These descriptive differences do not indicate a simple relationship between education, income, and prior donation. For example, respondents with prior donation were more likely to report technical or vocational education, but the difference in bachelor's-degree attainment was small. Most respondents reported income in the lowest income category, limiting the usefulness of reported income as a measure of socioeconomic variation. The appendix therefore considers housing characteristics and access to services, such as internet access, as supplementary indicators of household economic circumstances.

This pattern is consistent with the importance of family/replacement donation described in Section 2.1. It also implies that self-reported prior donation should not be interpreted as a measure of purely voluntary, anonymous, or altruistic donation. In Sierra Leone, prior donation may reflect family obligations, community networks, emergency needs, organized blood drives, or compensated and informal donation arrangements.

4.3 Knowledge, Motivations, Barriers, and Compensation Attitudes

Table 4 compares respondents with and without prior blood-donation experience on reported donation history, knowledge, motivations, perceived barriers, and attitudes toward compensation. Perception, motivation, barrier, and compensation items were administered to all respondents using five-point Likert scales, with higher values indicating greater agreement with each statement. The differences are descriptive and should not be interpreted as causal effects.

Table 4. Knowledge, Motivations, Perceived Barriers, and Compensation Attitudes

Variable	No Prior Donation	Prior Donation	Difference	Robust SE	P-value	N
Panel A. Reported Blood Donation History						
Previously donated for family member	0.007	0.533	0.526	0.043	0.0000	1013

Previously donated for friend	0.001	0.164	0.163	0.022	0.0000	1013
Previously donated during general blood drive	0.004	0.179	0.175	0.023	0.0000	1013
Panel B. Knowledge and Perceptions						
Heard about blood donation through social media	0.180	0.168	-0.013	0.027	0.6375	1011
Heard about blood donation through family	0.065	0.168	0.103	0.024	0.0000	1013
Blood donation saves lives	4.402	4.398	-0.004	0.062	0.9476	1008
People with illnesses should not donate blood	3.794	3.797	0.003	0.083	0.9708	1004
Pregnant women should not donate blood	3.715	3.765	0.050	0.086	0.5607	997
Blood donation harmful to donor	3.154	3.093	-0.061	0.099	0.5360	982
Blood donation associated with disease	3.391	3.217	-0.174	0.098	0.0753	984
Panel C: Stated Donation Motivations						
Blood donation has health benefits	3.806	3.768	-0.038	0.084	0.6480	994
Donate to help family member	4.143	4.192	0.049	0.069	0.4761	1006
Donate to help community	3.901	4.137	0.236	0.068	0.0005	996
Donate to save pregnant women and newborns	3.884	4.207	0.323	0.068	0.0000	1004
Religion encourages donation	3.521	3.705	0.184	0.091	0.0438	995
Want to know blood type	3.613	3.760	0.147	0.079	0.0637	991
Want to know disease status	3.643	3.734	0.091	0.083	0.2772	979
Financial incentives encourage donation	3.164	3.091	-0.073	0.098	0.4553	998
Panel D. Perceived Barriers to Donation						
Fear of needles	3.331	3.026	-0.305	0.105	0.0038	988
Fear of blood test results	3.192	3.159	-0.033	0.094	0.7257	996
Transportation cost barrier	3.267	3.397	0.130	0.093	0.1621	1001
Do not know donation location	3.176	3.064	-0.112	0.098	0.2538	981
Fear of fainting	3.289	3.160	-0.129	0.093	0.1667	1000
Panel E. Attitudes Toward Compensation						
Would accept monetary compensation	3.300	3.328	0.028	0.091	0.7550	1001
Compensation increases willingness to donate	3.358	3.207	-0.151	0.092	0.0992	995

Notes: Panel A reports proportions or means for self- reported blood-donation history. Panels B-E mean responses to five-point Likert-scale items, where 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, and 5 = Strongly agree. All perception, motivation, barrier, and compensation items were administered to

respondents with and without prior blood-donation experience. The difference column reports the coefficient from a regression of each outcome on an indicator for prior blood-donation experience. Robust standard errors are reported. The number of observations varies because of item nonresponse. Estimates are descriptive and should not be interpreted causally.

Respondents with prior blood-donation experience were more likely to report hearing about blood donation through family members. They expressed greater agreement that blood donation helps the community, saves the lives of pregnant women and newborns, and is encouraged by religion. Respondents with prior donation reported lower fear of needles than respondents with no prior donation. These descriptive patterns are consistent with the possibility that social networks, familiarity with donation, and perceived social benefits are associated with prior participation.

At the same time, several beliefs and barriers were similar across the two groups. Both groups strongly agreed, on average, that blood donation saves lives. Both groups also reported moderate agreement with statements concerning the potential health consequences of donation, fear of blood test results, transportation costs, and uncertainty about where to donate blood. These patterns suggest that awareness of the social value of blood donation may by itself generate participation when practical barriers and the immediate costs of attending a blood drive remain substantial.

Reported prior donation was frequently connected to family needs. Among respondents with prior donation, 53,5 percent reported having donated for a family member, whereas 17.9 percent reported having donated during a general blood drive. This pattern is consistent with the importance of family/replacement donation described in Section 2.1. It also implies that self-reported prior donation should not be interpreted as a measure of purely voluntary, anonymous, or altruistic donation.

The survey also provides limited evidence that stated preferences for financial compensation differ sharply by donation status. Mean responses to questions about accepting monetary compensation and whether compensation would increase willingness to donate were similar across the two groups. Stated attitudes, however, may not reliably predict actual behavior. The field experiments are therefore important because they estimate whether real incentives packages effect attendance decisions rather than relying only on hypothetical responses.

Taken together, the survey evidence suggests that prior blood donation in Sierra Leone is often connected to family and community obligations rather than anonymous voluntary donation alone. Respondents also report practical barriers to participation, including transportation costs, fear of needles, concerns about blood-test results, and uncertainty about donation locations. These descriptive findings motivate the experimental analysis, but they do not identify whether economic compensation increases attendance at blood drives. The following sections address that question using randomized assignment.

5. Experimental Results

This section presents the experimental evidence on the effects of incentive packages on blood-drive attendance. Section 5.1 reports results from Experiment 1, which compares noncash incentives with standard light refreshments. Section 5.2 reports preliminary results from the adaptive transport-reimbursement experiment. Section 5.4 presents secondary and exploratory evidence on attendee composition, repeat attendance, and information messages.

5.1 Effects of Noncash Incentives on Blood Drive Attendance

This section reports the intention-to-treat estimates from Experiment 1, which tested the effects of noncash incentive packages on community-level attendance. The analysis compares communities assigned to a full meal, an 8 GB mobile-data bundle, or a 20 GB mobile-data bundle with control communities that received standard light refreshments.

The outcome is the number of individuals who presented at a blood drive, registered, and completed initial eligibility screening. It does not, at this stage, distinguish between individuals who ultimately completed donation and those who were deferred or otherwise did not donate. The estimates should therefore be interpreted as effects on potential donor turnout rather than on completed donation or safe blood available for transfusion.

Descriptive patterns

Table 5 summarizes mean community-level attendance by experimental assignment. Mean attendance was lowest in the control group and rose monotonically across the meal, 8 GB, and 20 GB incentive arms. Control communities had mean attendance of five individuals, compared with 11 individuals in meal communities, 16 individuals in 8 GB communities, and 21 individuals in 20 GB communities.

Table 5. Community-Level Attendance by Experiment 1 Treatment Assignment

Incentive package	Mean attendance	Standard Deviation	Communities
Control	5.00	4.00	7
Meal	11.00	8.00	7
8GB	16.00	6.00	7
20GB	21.00	13.00	7
Total	13.06	10.07	28

Notes: The unit of observation is the community. Attendance is the number of individuals who presented at the blood drive, registered, and completed initial eligibility screening. The sample includes the 28 completed first-round Experiment 1 communities in the main specification, excluding Bombali District.

The descriptive differences are consistent with an economically meaningful relationship between incentive size and turnout. However, the descriptive means alone do not account for district-level differences in blood drive participation. The regression estimates below, therefore, include district fixed effects.

Table 6. Effects of Noncash Incentives on Community-Level Blood-Drive Attendance

	(1) Attendance	(2) Continuous Incentive Value
Full meal incentive	6.714*	
	(3.629)	
8 GB mobile-data incentive	11.29***	
	(3.634)	
20 GB mobile-data incentive	16.29***	
	(4.921)	
Stated incentive value (Leones)		0.0366***
		(0.0109)
District fixed effects	Yes	Yes
Observations	28	28
R-squared	0.670	0.622

Notes: The unit of observation is the community. The outcome is the attendance, defined as the number of individuals who presented at a blood drive, registered, completed initial eligibility screening. The omitted category in column (1) is the control group. Column 2 relates attendance to the stated Leone value of the assigned noncash package. All specifications include district fixed effects. The main sample excludes the four Bombali communities

because the Bombali control community was substantively atypical; estimates including Bombali are reported in Appendix Table A1. Standard errors are shown in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Treatment Effects

The regression results in Table 6 report estimates controlling for district fixed effects. Column 1 compares each noncash incentive package with the control condition. Relative to the control group, the full meal incentive increased attendance by approximately 6.7 individuals. The 8 GB mobile-data package increased attendance by approximately 11.3 individuals, and the 20 GB mobile-data package increased attendance by approximately 16.3 individuals. Using the currently reported standard errors, the meal estimate is statistically significant at the 10 percent level, while the two mobile-data estimates are statistically significant at conventional levels.

These effects are large relative to the mean attendance observed in the control group. The estimated meal effect corresponds to approximately 134 percent of the control-group mean. The 8 GB and 20 GB packages correspond to increases of approximately 226 percent and 326 percent, respectively. These percentages should be interpreted cautiously because the control mean is low. Nonetheless, the estimates suggest that the noncash incentive packages generated substantively meaningful increases in potential-donor turnout.

The ordering of the estimated is consistent with the stated values of the packages. The full meal was valued at approximately Le 60, the 8 GB mobile-data package at approximately Le 160, and the 20 GB mobile-data package at approximately Le 400. The 20 GB package generated the largest attendance response, followed by the 8 GB package and the meal.

Stated Incentive Value

Column (2) of Table 6 estimates the relationship between the stated value of the noncash package and community-level attendance. The estimated coefficient of 0.0366 implies that a Le 100 increase in the stated value of the package is associated with approximately 3.7 additional attendees. Using the currently reported standard errors, this relationship is statistically significant.

This specification should be interpreted with caution. The meal and mobile-data packages were different goods, and their stated program cost may differ from participants' subjective valuations. The discrete treatment-arm estimates in Column 1 therefore provide the more direct evidence. The positive value coefficient is nevertheless consistent with the pattern that higher-valued noncash packages generated greater attendance.

5.2 Effects of Transport Reimbursements on Blood Drive Attendance

This section reports preliminary findings from the adaptive transport-reimbursement experiment. The reimbursement experiment was introduced after implementation observations from Experiment 1 indicated that participants frequently preferred direct cash compensation or transport reimbursement rather than noncash benefits. The experiment was separately randomized in newly recruited communities and compares a no-reimbursement control condition with Le 30 and Le 60 transport-reimbursement conditions.

The current analysis includes the five districts that had completed all three reimbursement arms at the time of analysis: Bo, Bombali, Kenema, Kono, and Moyamba. The broader reimbursement experiment includes additional districts and remains ongoing. The results should therefore be understood as preliminary.

Table 7. Community-Level Attendance by Experiment 2 Reimbursement Assignment

Reimbursement Condition	Mean Attendance	Standard Deviation	Communities
No reimbursement control	8.60	9.66	5
Le 30 transport reimbursement	22.40	16.55	5
Le 60 transport reimbursement	35.60	17.21	5
Total	22.20	17.88	15

Notes: The unit of observation is the community. Attendance is defined as the number of individuals who presented at the blood drive, registered, and completed initial eligibility screening. The preliminary analysis includes five completed districts - Bo, Bombali, Kenema, Kono, and Moyamba – that had completed all three Experiment 2 treatment arms. The broader Experiment 2 rollout was ongoing at the time of analysis.

Table 7 reports mean community-level attendance by reimbursement assignment. Average attendance was 8.6 individuals in no-reimbursement control communities, 22.4 individuals in communities assigned to the Le 30 reimbursement, and 35.6 individuals in communities assigned to the Le 60 reimbursement.

The descriptive means show a strong positive relationship between the reimbursement amount and attendance. Relative to the control-group mean, attendance was 160 percent higher in the Le 30 arm and more than four times as high in the Le 60 arm. These descriptive comparisons should be interpreted cautiously because the analysis includes only 15 communities.

Table 8. Effects of Transport Reimbursements on Community-Level Blood Drive Attendance

	(1) Full sample	(2) Exclude Bombali
Le 30 transport reimbursement	13.80**	14.25*
	(4.757)	(6.015)
Le 60 transport reimbursement	27.00***	28.75***
	(5.680)	(7.060)
District fixed effects	Yes	Yes
Observations	15	12
R-squared	0.886	0.874

Notes: The unit of observation is the community. The outcome is attendance, defined as the number of individuals who presented at the blood drive, registered, and completed initial eligibility screening. All specifications include district fixed effects. The omitted category is the no-reimbursement control condition. Column 1 includes the 15 communities in the five districts that completed all Experiment 2 treatment arms. Column 2 excludes the three Bombali Districts because the Bombali control community was substantively atypical. The preliminary analysis includes five completed districts: Bo, Bombali, Kenema, Kono, and Moyamba. The broader Experiment 2 rollout was ongoing at the time of analysis. Robust standard errors in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Treatment Effects

Table 8 reports regression estimates controlling for district fixed effects. In column 1, the Le 30 transport reimbursement increased attendance by approximately 13.8 individuals relative to the no-reimbursement control condition. The Le 60 reimbursement increased attendance by approximately 27.0 individuals. Both estimates are statistically significant using reported standard errors.

Column 2 excludes Bombali District because the control community there was recruitment from a substantively different population, including university students in clinical laboratory science and related life-science fields. The estimated effects remain similar: Le 30 reimbursement increased attendance by approximately 14.3 individuals, while the Le 60 reimbursement increased attendance by approximately 28.8 individuals. The Le 60 estimate remains statistically significant at conventional levels, while the Le 30 estimate is statistically significant at the 10% level.

5.3 Comparing Cash and In-Kind Incentive Packages

The previous sections show that both noncash incentives and transport reimbursements increased blood drive attendance. This section pools community-level observations from the two experiments to summarize the relationship between attendance, stated value of the incentive package, and the form of compensation. The pooled analysis addresses a practical policy question: conditional on stated package value, were transport-reimbursement packages associated with higher attendance than noncash packages?

Pooled Analysis

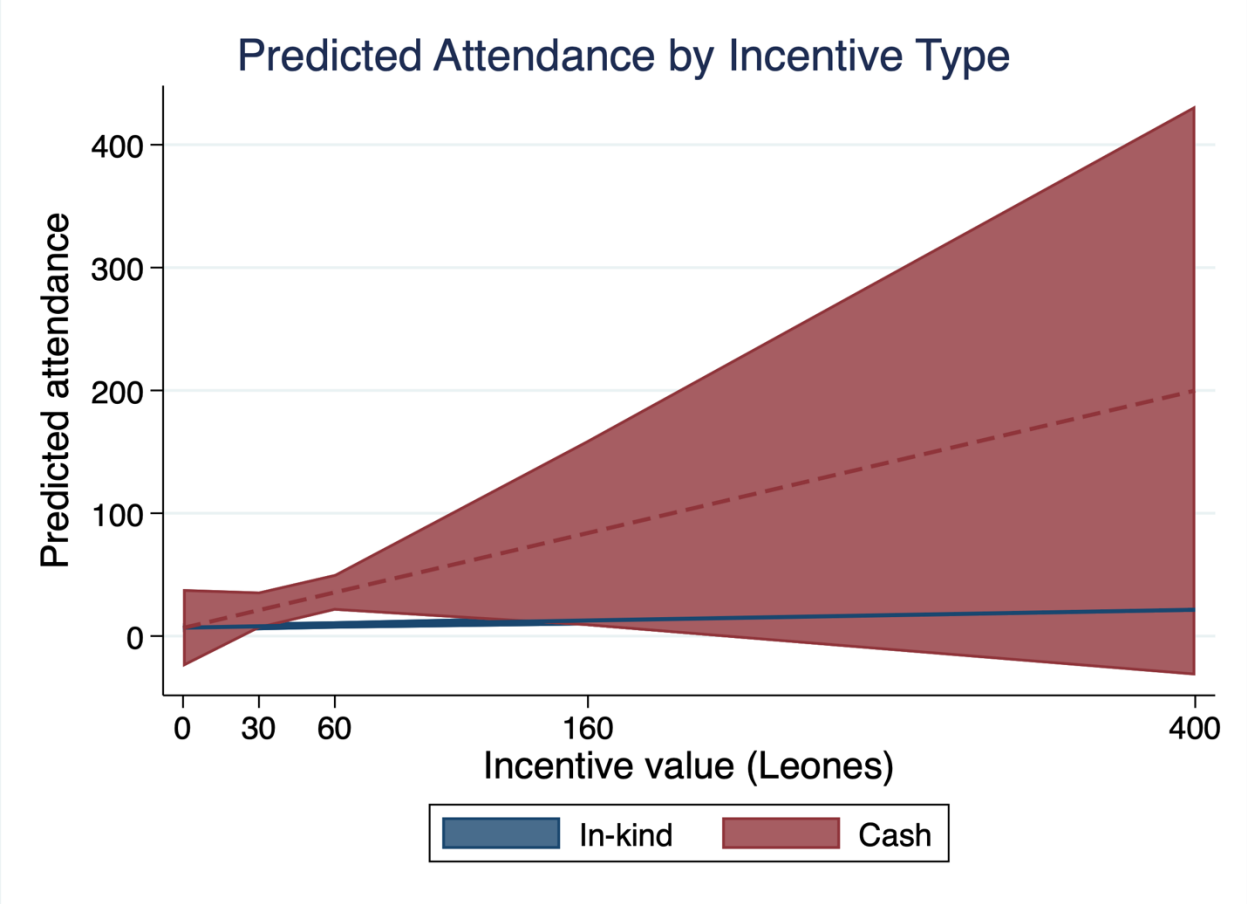
Table 9. Pooled Community-Level Relationship Between Attendance, Incentive Value, and Incentive Type

	(1) Attendance	(2) Attendance	(3) Attendance
Stated incentive value (Le)	0.0308**	0.0378**	0.0366**
	(0.0143)	(0.0140)	(0.0142)
Cash incentive		19.80***	-0.250
		(6.446)	(15.620)
Cash reimbursement x stated incentive value (Le)			0.447
			(0.320)
Experiment 2 indicator		-4.134	-4.325
		(4.194)	(4.268)
Constant	9.162**	4.563	4.754
	(3.969)	(3.743)	(3.380)
District fixed effects	Yes	Yes	Yes
Observations	40	40	40
R-squared	0.310	0.540	0.592

Notes: The unit of observation is the community. The outcome is blood drive attendance, defined as the number of individuals who presented, registered, and completed initial eligibility screening. The sample excludes Bombali District and includes 28 Experiment 1 communities and 12 Experiment 2 communities. Stated incentive value is the research team's estimated Leone cost of the assigned package. Cash reimbursement equals one for Le 30 and Le 60

transport-reimbursement treatments and zero for Experiment 1 noncash incentive treatments. The Experiment 2 indicator equals one for observations from adaptive transport-reimbursement experiment. All specifications include district fixed effects. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 3. Predicted Community-Level Attendance by Incentive Type and Stated Package Value



Notes: Predicted attendance is calculated from the pooled regression in Table 9, Column 3. Predictions are evaluated at the observed stated package values and include district fixed effects and the Experiment 2 indicator. Noncash packages include the full meal and mobile-data bundles; cash packages are transport-reimbursement treatments. The figure summarizes the relationship between stated package value, incentive type, and attendance. It should not be interpreted as isolating the causal effect of cash fungibility because cash and noncash packages differed in timing, delivery, salience, reliability, and subjective value.

Column 1 of Table 9 reports the relationship between the stated value of an incentive package and community-level attendance. The coefficient of 0.0308 implies that an additional Le 100 in stated package value is associated with approximately 3.1 additional attendees. This relationship is statistically significant using robust standard errors.

Column 2 adds indicators for cash reimbursement and Experiment 2. The coefficient on stated incentive value remains positive. Conditional on stated package value, district fixed effects, and an experiment indicator, transport-reimbursement communities had approximately

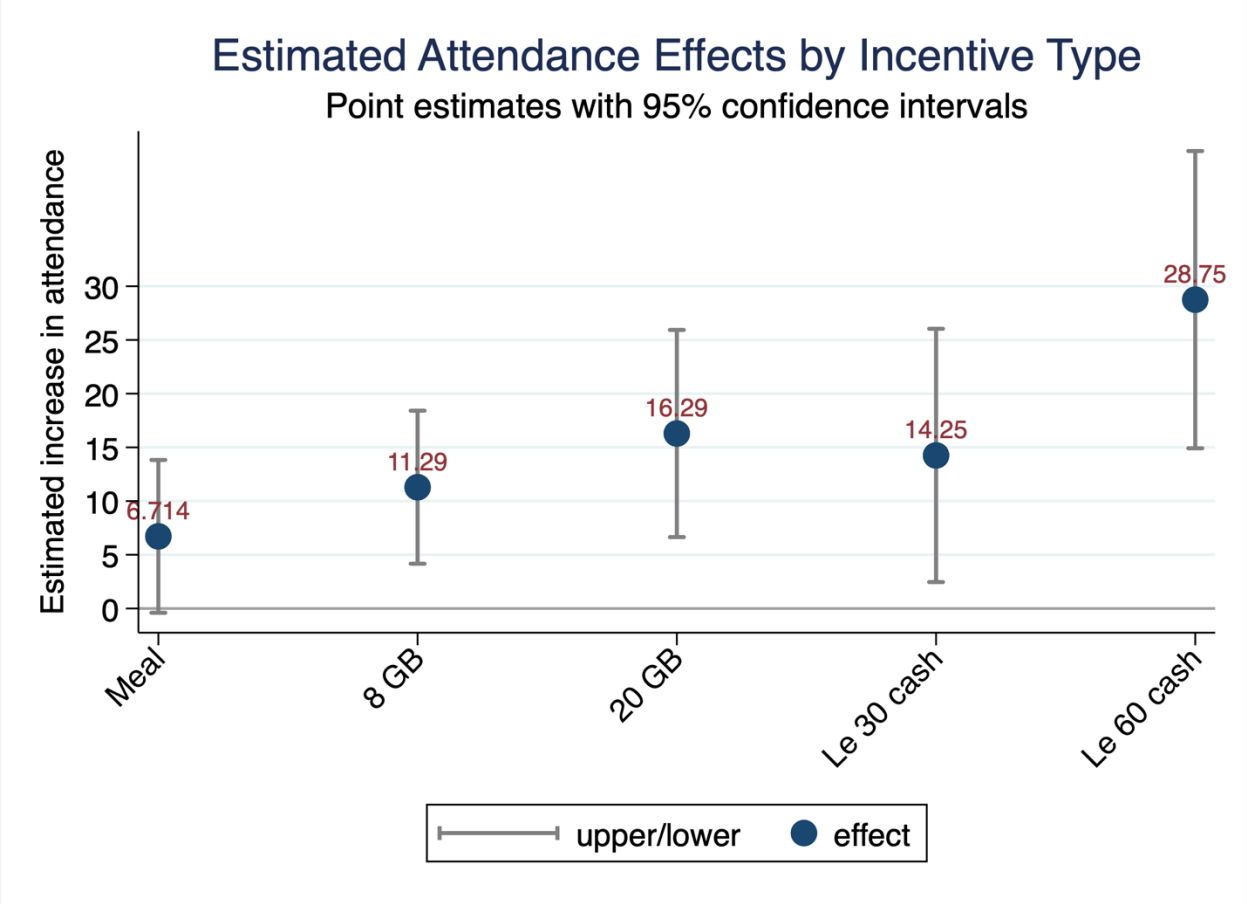
19.8 more attendees than noncash package communities. This estimate is statistically significant using robust standard errors.

The cash-reimbursement coefficient should not be interpreted as the effect of cash at stated package value of zero, because that value has no meaningful substantive interpretation. More broadly, the comparison should be interpreted cautiously. The pooled specification relies on a linear relationship between stated value and attendance and combines interventions that differed not only in whether compensation was cash or in kind, but also in timing, delivery, salience, reliability, and likely subjective value.

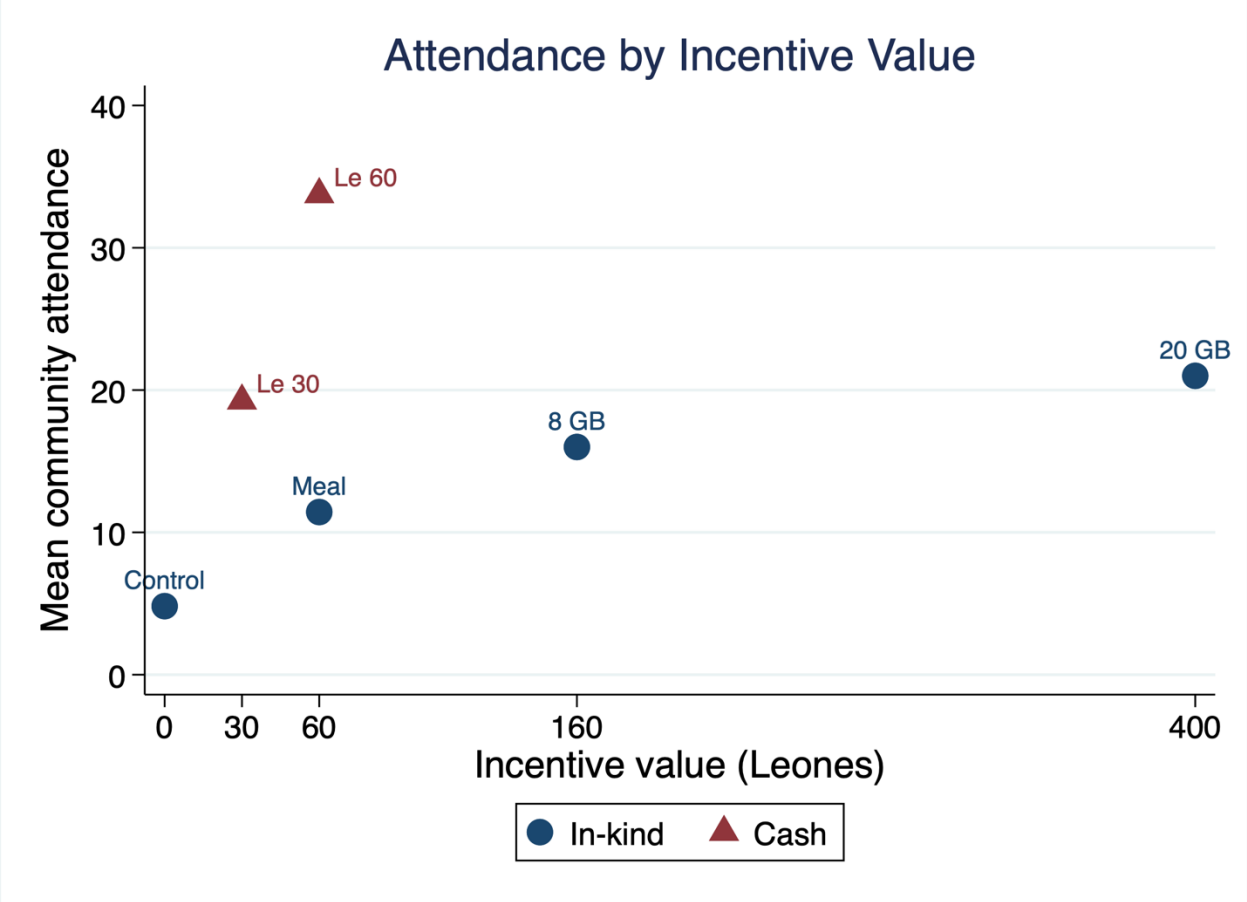
Column 3 allows the relationship between stated incentive value and attendance to differ between cash-reimbursement and noncash packages. The interaction coefficient is positive but not statistically distinguishable from zero. The available data do not provide precise evidence that attendance responds more strongly to additional stated value for cash packages than for noncash packages. The point estimates are consistent with higher attendance levels under cash-reimbursement packages, but the number of communities and distinct incentive values is limited.

The pooled regressions are informative descriptive summaries, but they do not isolate the causal effect of cash fungibility alone. The stronger causal evidence comes from the separately randomized treatment comparisons within Experiment 1 and Experiment 2. The equal-value comparison between the Le 60 meal and Le 60 transport reimbursement, presented below, provides a more transparent comparison of two packages with the same stated value.

Figure 3A: Estimated Effects by Incentive Type



Notes: Points show estimated treatment effects relative to the relevant no-incentive control condition. The full-meal estimate is from Experiment 1, and the Le 60 transport-reimbursement estimate is from Experiment 2. Vertical bars indicate the 95 percent confidence interval. Both models include district fixed effects and exclude Bombali District. Because the estimates come from separate experiments conducted in different communities, the figure should not be interpreted as a within-experiment causal estimate of the effect of cash relative to a meal.



Notes: Figure 3B plots mean community-level attendance by stated incentive value and incentive type. Attendance increased across the noncash incentive packages as stated package value increased. Transport-reimbursement packages generated higher attendance than noncash packages at the observed value. The figure is descriptive and does not separately identify the effects of cash, timing, delivery, salience, flexibility, or participants' subjective valuation of the packages.

Equal Value Comparison: Le 60 Meal Versus Le 60 Transport Reimbursement

A more intuitive comparison contrasts the Le 60 meal package in Experiment 1 with the Le 60 transport-reimbursement package in Experiment 2. Both packages had the same stated monetary value, but one provided a meal and drink, whereas the other provided an unrestricted cash payment framed as transport reimbursement.

Table 10. Comparison of Le 60 Meal and Transport-Reimbursement (Le 60) Packages

	(1) Community-level attendance
Full meal package (Le 60)	7.040*
	(3.916)
Transport reimbursement (Le 60)	28.180***

	(7.305)
District fixed effects	Yes
Observations	22.000
R-squared	0.757

Notes: The unit of observation is the community. The outcome is blood drive attendance, defined as the number of individuals who presented at the blood drive, registered, and completed initial eligibility screening. The full meal coefficient is estimated relative to Experiment 1 control communities, and the Le 60 transport-reimbursement coefficient is estimated relative to Experiment 2 no-reimbursement control communities. The omitted category is the relevant non-incentive control group. The analysis excludes Bombali district and includes 14 Experiment 1 communities and 8 Experiment 2 communities. All specifications include district fixed effects. Standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

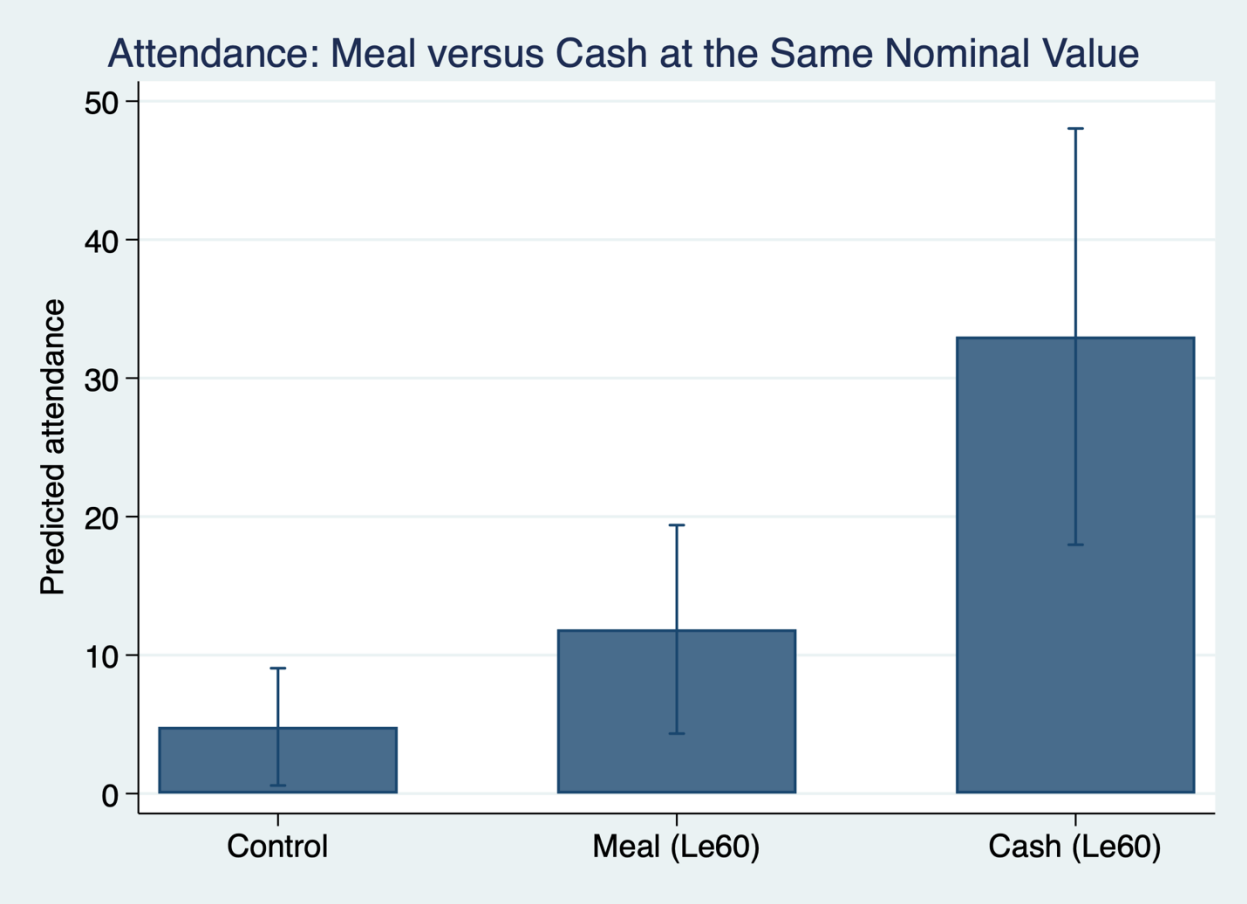


Figure 4. Attendance at community blood drives at equal nominal incentive value: meal versus cash reimbursement

The Le 60 full-meal package increased attendance by approximately seven individuals relative to Experiment 1 control condition, whereas the Le 60 transport-reimbursement package increased attendance by approximately 28 individuals relative to the Experiment 2 no-reimbursement control condition. The difference in point estimates is approximately 21 attendees.

This comparison is particularly salient because the two packages had the same stated value. However, equal program cost does not imply equal value to potential donors. The cash reimbursement was unrestricted and immediately usable. The meal could be consumed only in a particular form and at a particular time, its value may have depended on meal quality, local food prices, and implementation arrangements.

The comparison is informative but should be interpreted cautiously. The meal and reimbursement packages were implemented in separate experiments, with different communities and potentially different background conditions. It therefore supports the conclusion that the Le 60 transport-reimbursement package generated a larger estimated attendance response than the Le 60 meal package, but it does not isolate whether the difference arose from fungibility, immediacy, salience, transaction costs, food preferences, delivery, or other features of the treatment.

Interpretation

The pooled findings are consistent with several possible mechanisms. First, transport reimbursement may have relaxed immediate liquidity constraints. Potential donors may have needed resources for food, household expenses, debt, transportation, or other urgent uses. Because cash could be allocated across these needs, it may have had greater effective value than a similarly priced meal or data bundle.

Second, cash may have been more immediate and salient. A direct payment was simple and available immediately after the donation was completed. By contrast, mobile-data bundles required donors to provide a usable mobile-phone number and wait for delivery. Delays, particularly for Orange subscribers, may have reduced the credibility or immediate value of the mobile-data incentive.

Third, stated program costs may not correspond to participants' subjective valuations. A Le 400 data bundle may have been costly to provide but less valuable to an individual with limited data needs, uncertain network access, multiple SIM cards, or a stronger immediate demand for cash. Conversely, participants who valued data highly may have responded strongly to the larger mobile-data package.

Finally, the observed informal attempts to convert meals and mobile-data bundles into cash suggest that some participants valued the cash equivalent more highly than the designated in-kind item. This behavior is consistent with a preference for flexibility in the use of

compensation. It also illustrates the implementation challenges in-kind policies intended to avoid direct monetary payment.

This evidence does not identify which mechanism is dominant. The treatment packages differed along several dimensions, and the adaptive reimbursement experiment was introduced after the initial noncash experiment. The appropriate conclusion is therefore limited but policy relevant: in the setting studied, direct transport reimbursement packages generated larger attendance responses than the noncash packages, including a meal with the same stated value.

5.4 Secondary and Exploratory Results

Attendee composition

The preceding results show that noncash incentives changed the number of people attending blood drives. A separate question is whether the incentive packages also changed the observable composition of attendees. Table 11 compares attendee characteristics across the control and noncash incentive conditions.

Table 11 Characteristics of Experiment 1 Attendees by Incentive Assignment

Sample: Individuals who attended first-round Experiment 1 blood drives. Randomization unit: community.

Variable	Control	Full Meal	8 GB Data	20 GB Data	Range of Standardized Differences
Age, mean (SD)	29.57 (9.56)	31.61 (11.30)	28.88 (8.33)	26.53 (7.65)	-0.35 to 0.20
Female (%)	26.7	17.4	12.5	6.1	-0.58 to -0.22
Prior donations, mean (SD)	8.12 (14.33)	3.23 (5.48)	2.27 (4.53)	2.66 (4.55)	-0.55 to -0.45
Monthly income, mean (SD)	937.78 (1194.75)	713.72 (1028.76)	779.42 (993.71)	639.99 (898.31)	-0.28 to -0.14
Attendees	60	86	120	148	414

Notes: The sample includes individuals who presented at a first-round Experiment 1 blood drive, registered, and completed initial eligibility screening, regardless of whether they ultimately completed donation. The values are means, with standard deviations in parentheses, unless otherwise indicated. Standardized differences compare each incentive arm with the control arm. Because treatment assignment may affect who attends, these statistics describe the composition of attendees across treatment assignments; they are not pre-treatment balance statistics. Age is available for a subset of attendees because some date-of-birth records were missing or invalid. Treatment was assigned at the community level.

The descriptive statistics indicate that the observable composition of attendees differs across incentive environments. Attendees in the higher-value mobile-data arms were, on average, younger and had fewer prior donations than attendees in the control arm. Female attendance was lower in each incentive arm than in the control arm, particularly in the 20 GB arm. Reported monthly income was also lower, on average, in the incentive arm. Because these characteristics are observed only among individuals who attended after treatment assignment, these differences should be interpreted as descriptive evidence on attendee composition, rather than as pre-treatment imbalance.

Table 12. Effects of Noncash Incentives on the Composition of Experiment 1 Attendees

	(1)	(2)	(3)	(4)	(5)
	prior donations	Female	Age	monthly income	Meals per day
Full meal	-5.704*	-0.073	4.406	-148.669	0.265
	(3.164)	(0.089)	(4.666)	(154.387)	(0.173)
8 GB data	-6.271**	-0.119	1.125	-164.340	0.045
	(2.885)	(0.074)	(4.069)	(128.706)	(0.159)
20 GB data	-6.270*	-0.183**	-0.840	-263.077*	0.189
	(3.076)	(0.082)	(4.716)	(149.644)	(0.198)
District fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	413	414	149	411	405
R-squared	0.128	0.080	0.109	0.078	0.069

Notes: Each column reports a regression of an attendee characteristic on indicators for assigned incentive treatment. The omitted category is the control group. All specifications include district fixed effects. Treatment was assigned at the community level. These estimates describe differences in the observable composition of attendees across assigned incentive environments; they do not estimate changes in characteristics of a fixed set of individuals. Standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 12 examines whether noncash incentives were associated with differences in the observable composition of individuals attending blood drives. Relative to the control group, all three incentive arms attracted attendees with fewer prior donations. The estimated differences range from approximately 5.7 to 6.3 fewer prior donations. The estimated difference is statistically significant at the conventional five percent level for the 8 GB arm and at the 10 percent level for the full meal and the 20 GB arms.

The 20 GB mobile-data arm was also associated with a lower share of female attendees and lower reported monthly income relative to the control group. The estimated difference in female representation is approximately 18 percentage points. The analysis does not detect statistically significant differences in attendee age or meals consumed per day.

These estimates should not be interpreted as evidence that incentives changed an individual's age, income, or prior donation history. Rather, they suggest that the treatment environments attracted groups of attendees with different observable characteristics. Changes in turnout and attendee composition reinforce the importance of examining completed donation, deferrals, and blood-screening outcomes before concluding that increased attendance translates one-for-one into a greater supply of safe, usable blood.

Attendee Composition under Transport Reimbursements

Table 13 reports descriptive characteristics of attendees in the preliminary Experiment 2 sample. The sample includes individuals who presented at a blood drive, registered, and completed initial eligibility screening, regardless of whether they ultimately completed donation.

Table 13. Individual-Level Descriptive Statistics

Variable	Mean	Standard Deviation	Observations
Prior donations	1.40	3.76	333
Female	0.20	0.40	333
Age (years)	28.19	10.10	328
Monthly income	789.96	1094.31	331
Meals per day	2.60	0.85	332

Note: The table reports characteristics of individuals who attended a preliminary Experiment 2 blood drive: they presented, registered, and completed initial eligibility screening, regardless of whether they ultimately completed donation. The analysis includes the 15 communities in five districts-Bo, Bombali, Kenema, Kono, and Moyamba, - that had completed all three treatment arms. The broader Experiment 2 rollout was ongoing at the time of analysis.

Participants reported an average of 1.4 previous blood donations, indicating that the sample includes both first-time and repeat donors. Approximately 20 percent of participants were female. The average participant was 28.2 years old, reported a monthly income of approximately Le 790, and reported consuming an average of 2.6 meals per day.

Table 14. Effects of Transport Reimbursement on the Composition of Experiment 2 Attendees

	(1)	(2)	(3)	(4)	(5)

	Prior Donations	Female	Age	Monthly Income	Meals per Day
Le 30	-1.187	-0.176**	2.041	617.921***	0.419***
	(1.384)	(0.078)	(1.626)	(173.178)	(0.146)
Le 60	-1.515	-0.102	1.056	449.061***	0.545***
	(1.348)	(0.078)	(1.526)	(130.192)	(0.150)
District fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	333.000	333.000	328.000	331.000	332.000
R-squared	0.069	0.027	0.040	0.035	0.080

Notes: Each column reports a regression of an attendee characteristic on indicators for assigned transport-reimbursement condition. The omitted treatment category is the no-reimbursement control group. All specifications include district fixed effects. Treatment was assigned at the community level. These estimates describe differences in the observable composition of attendees across assigned reimbursement environments; they do not estimate changes in the characteristics of a fixed set of individuals. Robust standard errors in parentheses. The preliminary analysis includes five completed districts: Bo, Bombali, Kenema, Kono, and Moyamba. The broader research program includes additional districts; Experiment 2 is ongoing. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14 examines whether transport reimbursements were associated with differences in the observable composition of attendees relative to the no-reimbursement control group. The estimates provide little evidence that reimbursement changed the prior-donation experience or age profile of attendees. Neither the Le 30 nor the Le 60 reimbursement was statistically associated with prior donations or attendee age.

There is some evidence of differences in other attendee characteristics. Relative to the control group, the Le 30 reimbursement was associated with an approximately 18 percentage points lower share of female attendees. The estimate for the Le 60 transport reimbursement was smaller and not statistically significant. This pattern should be interpreted cautiously because female participation is low overall and the preliminary sample includes only 15 communities.

Both reimbursement arms were associated with higher reported monthly income and more higher numbers of meals consumed per day. The estimated monthly income differences were approximately Le 618 for those in the Le 30 transport reimbursement arm and Le 449 for those in the Le 60 transport-reimbursement arm. The point estimates do not rise monotonically with the reimbursement amount, so the results do not provide a precise basis for a dose-response interpretation of attendee composition.

The differences between the noncash and reimbursement composition results are potentially informative but should not be overinterpreted. The 20 GB mobile-date package was associated with lower reported income relative to the Experiment 1 control condition, whereas the reimbursement packages were associated with higher reported income relative to the Experiment 2 control condition. Because these comparisons span separate experiments, communities, and implementation periods, they do not establish that cash and n-kind incentives differentially selected attendees by income.

Taken together, the results suggest that transport reimbursements substantially increased community-level attendance while leaving several key attendee characteristics, including prior donation experience and age, broadly similar across treatment groups. At the same time, the reimbursement treatment was associated with differences in some socioeconomic characteristics of attendees. Because Experiment 2 remains ongoing, these findings should be viewed as preliminary.

Repeat Attendance and Informational Messages

This section examines whether informational messages affected return attendance among individuals who participated in Experiment 1. The analysis considers two information treatments: a statistical-beneficiary message emphasizing that one unit of blood donation may benefit 3 people and a narrative-beneficiary message describing a patient whose life was saved through voluntary blood donation.

The information treatment was assigned at the district level, whereas the initial noncash incentive treatment was assigned at the community level. Of the 10 randomized districts, four had completed Round 2 follow-up at the time of analysis: Bo, Kenema, Moyamba, and Port Loko. The repeat-attendance sample therefore includes 245 verified initial attendees from 16 communities. Because only four districts had completed follow-up, the information analysis is exploratory.

Among the 245 initial attendees in the completed districts, 36 individuals (14.7 percent) were verified to have returned from a subsequent blood drive. Return rate varied across districts, from 8.7 percent in Kenema to 34.9 percent in Port Loko.

Round 2 outcome data were available for four of the ten randomized districts at the time of analysis. The remaining six districts had not yet completed Round 2 fieldwork and were therefore excluded from the current outcome analysis. Their exclusion reflects the timing of fieldwork rather than treatment-based attrition or a re-randomization of the information treatment.

Table 15: Return Attendance by District and Information Assignment

District	Information assignment	Initial attendees	Returned attendees	Return rate
Bo	Statistical beneficiary	42	5	11.9%
Kenema	Baseline	104	9	8.7%
Moyamba	Narrative beneficiary	56	7	12.5%
Port Loko	Baseline	43	15	34.9%
Total		245	36	14.7%

Note: The table includes the four districts with completed Round 2 follow-up at the time of analysis. Return attendance is defined as verified attendance at a subsequent blood drive among individuals who attended an initial Experiment 1 blood drive.

The repeat-attendance analysis includes 245 verified initial attendees from the four districts that had completed follow-up fieldwork. Of these individuals, 36 (14.7%) were verified to have attended a subsequent blood drive. Return rates varied substantially across districts, ranging from 8.7% in Kenema to 34.9% in Port Loko.

Table 16. Repeat Attendance at Blood Donation: Incentives and Information

	(1) Incentives only	(2) Information only	(3) Additive model
Meal vs. Control	0.093		0.107
	(0.060)		(0.040)
8 GB vs. Control	0.108		0.122
	(0.059)		(0.040)
20 GB vs. Control	0.240		0.263
	(0.071)		(0.064)
Narrative vs. Baseline		-0.038	-0.067
		(0.089)	(0.104)

Statistical vs. baseline		-0.044	0.011
		(0.089)	(0.086)
Observations	245	245	245
R-Squared	0.050	0.003	0.057
Districts	4	4	4
Communities	16	16	16

Notes: The dependent variable equals one if an initial attendee was verified to attend a subsequent blood drive through the donor-linkage procedure. The sample includes 245 initial attendees from 16 communities in four districts with completed follow-up: Bo, Kenema, Moyamba, and Port Loko. Initial incentives assignment occurred at the community level. Information assignment occurred at the district level through complete randomization of 10 districts: four baseline, three narrative beneficiary, and three statistical beneficiary districts. The 8 GB and 20 GB packages correspond to cumulative mobile-data allocation of 2 GB and 5 GB per month, respectively, over four months. Coefficients are linear probability model estimates.

Parentheses report district-clustered standard errors; these are descriptive because only four districts had completed follow-up. Exact randomization inference based on all the original 10-district assignment mechanism yields an omnibus p-value of 0.733 for the information-treatment terms. Conditional exact randomization-inference p-value are 0.583 for narrative versus baseline information and 0.833 for statistical versus baseline information. Wild cluster bootstrap tests, reported in Appendix A, are sensitivity analyses.

Table 16 reports exploratory estimates of repeat attendance. The estimates suggest higher verified return attendance among individuals initially assigned to the larger mobile-data packages. In the additive specification, the estimated return rate was 12.2 percentage points higher in the 8 GB group and 26.3 percentage points higher in the 20 GB group than in the initial control group. These estimates should be interpreted cautiously because return attendance was observed only in the subset of communities with completed follow-up.

We do not detect evidence that the district-level information messages increase repeat attendance in the currently completed sample. Relative to baseline information, the estimated coefficient was -6.7 percentage points for narrative-beneficiary information and 1.1 percentage points for statistical-beneficiary information. Exact randomization inference based on the original 10-district assignment mechanism yielded an omnibus p-value of 0.733. The conditional exact randomization inference p-values were 0.583 for narrative versus baseline information and 0.833 for statistical versus baseline information.

These results are exploratory. Only four of the 10 randomized districts had completed follow-up at the time of analysis, including one narrative-beneficiary district and one statistica-beneficiary district. The analysis therefore does not provide a precise test of whether these

messages affect repeat blood-drive attendance. It indicates only that the messages used in this study did not generate a detectable increase in return attendance in the currently available sample.

Completed Donations, Deferrals, and Blood Screening Outcomes

The present analysis focuses on attendance because that is the primary outcome currently available in the community-level experimental data. However, the policy value of increased attendance depends on whether additional attendees are eligible to donate, complete donation, and provide blood that passes routine screening.

Data on completed donations, hemoglobin-based deferrals, other eligibility deferrals, blood-test results are being collected and validated. These outcomes are central to evaluating whether economic incentives affect not only potential-donr turnout, but also the number and safety of blood units ultimately available for transfusion.

6. Discussion and Conclusion

Main Findings

Blood shortages are a persistent challenge for health systems in many low-income countries. Increasing the availability of safe blood requires a functioning system for donor recruitment, collection, screening, storage, transportation, and distribution. This paper examines one component of that system: whether economic incentives increase attendance at community blood drives in Sierra Leone.

The study combines descriptive survey evidence with a multi-district field experiment. The survey shows that prior donation is frequently connected to family and community obligations and that potential donors report several barriers to participation, including transportation costs, fear of needles, concern about test results, and uncertainty about donation locations. These descriptive findings informed the intervention design but do not themselves identify causal effects.

The experimental results show that noncash incentives increased community-level attendance, in Experiment 1, the full-meal package and the 8 GB mobile-data package increase attendance, while the 20 GB mobile-data package generated larger effects. The pattern is broadly increasing in the stated value of noncash package. These results suggest that potential donors

respond to tangible benefits and that the private costs of attending a blood drive are sufficiently large for incentives to alter participation decisions.

The adaptive transportation reimbursement generated the largest estimated attendance effects. In the preliminary completed district sample, a Le 30 reimbursement increased attendance by approximately 14 individuals relative to a no-reimbursement control condition, while a Le 60 reimbursement increased attendance by approximately 27-29 individuals. Although Experiment 2 sample remains limited and the broader rollout is ongoing, the estimates are consistent with a positive response to reimbursement amount.

Interpretation and Mechanisms

The findings should not be interpreted as identifying cash fungibility alone. The cash and in-kind packages differed in several dimensions. Transport reimbursements were immediate, whereas mobile-data bundles were delivered after the blood drive and sometimes experienced delays. The meals and mobile-data bundles also differed from reimbursements in resale opportunities, delivery procedures, salience, and likely subjective value. In addition, the reimbursement experiment was adaptively and implemented in newly recruited communities after the initial noncash experiment. The results therefore compare the effectiveness of the tested packages as implemented, rather than the effect of cash holding timing, delivery, salience, and all other treatment features constant.

The findings contribute to debates about incentives and prosocial behavior. The results provide little support for the proposition that modest economic incentives necessarily eliminate participation in blood donation. Instead, both noncash and cash incentives increased attendance. This pattern is consistent with the conceptual framework: potential donors may value helping others but still face transport costs, liquidity constraints, food insecurity, lost labor time, and other household costs that prevent them from attending blood drives.

The information intervention produced limited evidence of increase in repeated attendance in the currently available data. Neither the statistical beneficiary nor narrative-beneficiary message generated a clear positive main effect in the current analysis. These estimates are exploratory because information was assigned at the district level, message delivery was incomplete, and the number of districts was small (four). Thus, these results should not be interpreted as evidence that information campaigns are ineffective in general. Rather, they

indicate that the particular messages and delivery structure tested here did not generate a detectable increase in return attendance in the completed sample.

The attendee-composition results further illustrate why attendance should not be the sole outcome of interest. Noncash incentives were associated with attendees who had fewer prior donations, while reimbursement packages were associated with difference in some observable socioeconomic characteristics. These patterns may reflect changes in who finds it worthwhile to attend under different incentive regimes. Whether these compositional changes are beneficial, neutral, or concerning depends on eligibility, completed donation, deferrals, and screening outcomes.

Policy Implications, Cost-Effectiveness, and Scale-Up

The policy implication should be considered in light of WHO guidance favoring voluntary non-remunerated donation. The WHO generally permits refreshments and reimbursement of direct travel costs while discouraging payments that substitute for payment for blood ("Blood Safety and Availability," n.d.; *Global Status Report on Blood Safety and Availability 2021* 2022). In practice, the distinction can be difficult to maintain in low-income settings, where travel costs vary and even modest reimbursement may have substantial value for individuals facing liquidity constraints.

The present findings suggest that transport reimbursement can be an effective recruitment tool, but they do not resolve the ethical and safety questions surrounding compensation. Those questions require evidence not only on attendance but also on safe units collected, donor health, repeat participation, and the consequences for existing voluntary donation norms. A full policy assessment requires cost-effectiveness estimates, including the cost per additional attendee, cost per additional completed donation, and ultimately the cost per additional eligible and safe unit of blood collected. The latter measures require validated information on incentive-delivery cost, screening outcomes, deferrals, completed donation, wastage, and the capacity of collection and laboratory systems.

Limitation

Several limitations merit emphasis. First, Experiment 2 was adaptive and remains preliminary, although it was separately randomized in newly recruited communities. Second, the number of communities and districts is limited, particularly for information and repeat-attendance analysis. Third, some treatment features, including the delivery of mobile data bundles and information

messages, were implemented imperfectly. Fourth, the findings may not generalize directly to settings with different economic conditions, donor cultures, blood service infrastructure, or compensation regulations.

Despite these limitations, the study offers experimental evidence on a policy question that remains underexamined in Sub-Saharan Africa. How do blood services recruit potential blood donors in a setting where the private costs of participation are high and access to safe blood is limited? The evidence indicates that economic incentives can substantially increase blood drive attendance and that direct cash reimbursement packages may be more effective than the in-kind packages. Expanding safe blood availability, however, requires more than increased turnout. It also requires investment in collection supplies, trained personnel, laboratory capacity, screening, storage, transportation, and equitable distribution across health facilities.

Conclusion

The study provides experimental evidence on donor recruitment in a setting where the private costs of participation are high and access to safe blood is limited. The evidence indicate that economic incentive packages can substantially increase attendance at community blood drives in Sierra Leone. Transport -reimbursement packages generated the largest estimated attendance responses among the interventions tested while noncash meal and mobile-data packages also increase attendance.

The classic blood donation literature asks whether extrinsic incentives crowd out intrinsic altruism. In Sierra Leone, this question is incomplete because donors face immediate household constraints: food insecurity, transport costs, unstable income, physically demanding work, and uncertainty about the blood system. Individuals may be altruistic but unable to bear the private cost of anonymous donation. Incentives may therefore increase attendance not because altruism is absent, but because compensation relaxes binding constraints. The form of compensation matters because cash, meals, and mobile data bundles differ in flexibility, timing, reliability, and effective value.

The findings do not establish that incentives increase the final supply of safe blood, nor do they identify the socially optimal incentive package. Expending safe blood availability requires more than increased turnout.

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Appendix

Appendix A. Survey Methods and Supplementary Descriptive Evidence

A.1 Survey Methods

The survey instrument was developed following an extensive review of the literature on blood donation in resource-limited settings, including studies examining donation patterns in Sub-Saharan Africa. The questionnaire collected detailed sociodemographic and socioeconomic information from respondents. A second section presented hypothetical scenarios designed to examine the factors underlying respondents' decision-making regarding blood donation. These questions were intended to distinguish between intrinsic and extrinsic motivations for donating blood.

The survey was designed to assess urban-rural and socioeconomic differences in perceptions of blood donation, as well as the trade-offs individuals make when deciding whether to donate. Perceived barriers to and motivators for blood donation were measured using five-point Likert-scale items with the following response options: strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree.

Survey Sample and Administration

In-person surveys were conducted in Sierra Leone between late 2024 and early 2025. Participants were recruited using a multistage cluster sampling design at the district level. Individuals below 18 years of age were not eligible to participate in the survey. Approximately 1,500 adults from the general adult population were recruited using structured district-level sampling procedures. to participate. The survey was in English, and those who could not read and/or write in English were provided with translators.

The study aimed to obtain geographically broad descriptive evidence on adults across Sierra Leone. Data collection was conducted in 10 of the country's 16 districts, spanning all four provinces. The 10 districts were Bo, Bombali, Kambia, Kenema, Koinadugu, Kono, Moyamba, Port Loko, Western Rural Area, and Western Urban Area.

Within each district, survey interviews were conducted in public spaces using a simple random-walk sampling procedure. Interviewers approached passersby at predetermined intervals to minimize selection bias. The vast majority of individuals approached consented to participate. Each participant received Le 20 (approximately USD 0.85) as compensation for their time.

To ensure data quality and adherence to field protocols, the principal investigator conducted random back-checks of completed surveys. Data quality concerns were identified in the surveys collected in Moyamba District. Consequently, all observations from Moyamba District were excluded from the final analytical sample. N= …

Survey Analysis

Survey data were imported into Microsoft Excel for initial organization and then analyzed using Stata. After data cleaning, regression models were estimated using a sequential specification approach. Covariates were added in stages, beginning with demographic characteristics, followed by family characteristics, educational attainment, and household and social characteristics.

Although the survey collected monthly household income using categorical brackets (e.g., Le 0–1,000; Le 1,001–2,000), nearly all respondents reported incomes within the lowest category, providing insufficient variation for meaningful statistical analysis. Therefore, housing type was used as a proxy for socioeconomic status, with concrete housing representing the highest level of housing quality in Sierra Leone.

Appendix Table A1. Characteristics of Respondents With and Without Prior Blood-Donation Experience

Variable	No prior donation	Prior donation	Difference	Robust SE	P-value	Observations
Age (years)	29.287	32.832	3.545	0.754	0.0000	1009
Female	0.578	0.387	-0.191	0.035	0.0000	1013
Number of blood donations	0.060	1.730	1.670	0.120	0.0000	886
Has children	0.534	0.786	0.252	0.031	0.0000	1009
Number of children	1.378	2.562	1.184	0.156	0.0000	990
Single	0.609	0.380	-0.229	0.034	0.0000	1013
Cohabiting	0.043	0.036	-0.007	0.014	0.6167	1013
Married	0.330	0.529	0.199	0.035	0.0000	1013
Separated	0.007	0.029	0.022	0.011	0.0349	1013
Divorced	0.003	0.011	0.008	0.007	0.2104	1013
Widowed	0.008	0.044	0.036	0.034	0.2877	1013
Never attended school	0.121	0.151	0.030	0.025	0.2226	999
Primary education	0.059	0.089	0.029	0.024	0.2179	999

Junior secondary education	0.177	0.159	-0.019	0.026	0.4822	999
Senior secondary education	0.330	0.221	-0.108	0.031	0.0004	999
Technical/vocational education	0.096	0.151	0.055	0.024	0.0239	999
Bachelor's degree	0.223	0.218	-0.005	0.029	0.8702	999
Master's degree or above	0.005	0.018	0.013	0.009	0.1336	999
Unemployed	0.163	0.074	-0.089	0.021	0.0000	991
Formally employed	0.110	0.188	0.078	0.026	0.0033	992
Informally employed	0.139	0.206	0.067	0.028	0.0159	992
Self-employed	0.324	0.463	0.140	0.035	0.0001	992
Student	0.383	0.221	-0.163	0.031	0.0000	992
Retired	0.010	0.007	-0.002	0.006	0.7090	992
Monthly income: Le 0-1,000	0.366	0.382	0.016	0.035	0.6536	955
Income: 1,001-2,000	0.049	0.066	0.017	0.017	0.3361	955
Income: 2,001-3,000	0.024	0.054	0.030	0.015	0.0524	954
Income: 3,001-4,000	0.013	0.023	0.010	0.010	0.3203	955
Income: 4,001-5,000	0.010	0.004	-0.006	0.005	0.2519	955
Income: 5,001-6,000	0.010	0.012	0.002	0.008	0.8421	955
Income: 6,001-7,000	0.003	0.004	0.001	0.004	0.8209	955
Income: 7,001-8,000	0.007	0.019	0.012	0.009	0.1851	955
Income: 8,001-9,000	0.003	0.015	0.013	0.008	0.1135	955
Income: 9,001-10,000	0.006	0.008	0.002	0.006	0.7484	955
Income above 10,000	0.011	0.008	-0.004	0.007	0.5782	955
Muslim	0.592	0.661	0.070	0.035	0.0471	952
Christian	0.403	0.335	-0.068	0.035	0.0524	952
Indigenous/traditional faith	0.001	0.008	0.006	0.006	0.2615	952

Notes: This table reports mean characteristics by self-reported prior blood-donation status. The difference column is estimated from a regression of each characteristic on an indicator for prior blood-donation experience. Robust standard errors are reported. Binary variables are reported as proportions. The number of observations varies across characteristics because of item nonresponse. The differences are descriptive and should not be interpreted causally.

A.2 Conditional Association with Self-Reported Prior Blood Donation

Table A2 reports linear probability models in which the dependent variable equals one if a respondent reported having previously donated blood. The specifications sequentially add demographic, socioeconomic, perception, motivation, and barrier variables. The models are descriptive: the coefficients should be interpreted as conditional associations rather than causal effects.

The estimating equation is:

$$PriorDonation_i = \alpha + X_i'\beta + \varepsilon_i,$$

Where p$riorDonation_i$ is an indicator for whether a respondent reports having previously donated blood, Xi is a vector of respondent characteristics and stated beliefs, and ε_i an error term. Robust standard errors are reported.

Appendix Table A.2: Conditional Association With Self-Reported Prior Donation

	(1) Demographics	(2) Socioeconomic	(3) Perceptions	(4) Motivations	(5) Barriers
Female	-0.136***	-0.158***	-0.157***	-0.162***	-0.148***
	(0.028)	(0.031)	(0.032)	(0.032)	(0.034)
Age	0.006***	-0.003	-0.002	-0.002	-0.002
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Has children		0.076*	0.070	0.055	0.038
		(0.045)	(0.047)	(0.048)	(0.051)
Number of children		0.051***	0.050***	0.049***	0.051***
		(0.013)	(0.014)	(0.014)	(0.015)
Married		-0.005	0.007	0.008	0.003
		(0.044)	(0.045)	(0.046)	(0.048)
Cohabiting		0.034	0.005	0.009	0.013
		(0.081)	(0.079)	(0.078)	(0.081)
Primary education		0.005	0.007	0.004	0.009
		(0.041)	(0.041)	(0.041)	(0.043)
Junior high education		0.006	0.016	0.021	0.042
		(0.055)	(0.057)	(0.056)	(0.061)
High school education		-0.018	-0.010	-0.012	0.005
		(0.052)	(0.053)	(0.053)	(0.057)
Technical education		0.095	0.106	0.110*	0.117*
		(0.065)	(0.066)	(0.066)	(0.070)
Bachelor degree		0.031	0.036	0.048	0.060
		(0.054)	(0.056)	(0.056)	(0.059)
Master degree		0.164	0.101	0.082	0.112
		(0.187)	(0.196)	(0.202)	(0.201)

Zinc housing	0.129***	0.120***	0.118**	0.119**
	(0.044)	(0.046)	(0.047)	(0.050)
Concrete housing	-0.006	0.000	-0.014	-0.012
	(0.039)	(0.040)	(0.042)	(0.043)
Wood housing	0.121	0.108	0.083	0.086
	(0.087)	(0.091)	(0.088)	(0.096)
Other housing	-0.069	-0.068	-0.046	-0.028
	(0.053)	(0.055)	(0.068)	(0.086)
Electricity	-0.045	-0.044	-0.032	-0.033
	(0.036)	(0.038)	(0.040)	(0.042)
Television	0.062	0.066	0.082*	0.072
	(0.044)	(0.046)	(0.048)	(0.050)
Radio	-0.023	-0.028	-0.027	-0.030
	(0.031)	(0.033)	(0.034)	(0.036)
Tap water	0.023	0.030	0.022	0.029
	(0.041)	(0.042)	(0.043)	(0.045)
Internet access	0.136***	0.144***	0.141***	0.122**
	(0.050)	(0.051)	(0.053)	(0.056)
Christian	-0.053*	-0.053*	-0.048	-0.061*
	(0.031)	(0.032)	(0.032)	(0.034)
Indigenous religion	0.270***	0.240**	0.235**	0.212*
	(0.090)	(0.099)	(0.101)	(0.108)
Blood donation saves lives		0.014	0.008	0.002
		(0.018)	(0.019)	(0.020)
Illness prevents donation		-0.000	-0.003	0.004
		(0.014)	(0.014)	(0.015)
Health benefits of donation		-0.011	-0.015	-0.016
		(0.013)	(0.014)	(0.015)
Know blood type		0.006	-0.007	-0.006
		(0.014)	(0.014)	(0.016)
Help family through donation			-0.007	0.002
			(0.018)	(0.020)

Community donation				0.016	0.012
				(0.017)	(0.018)
Help neighbors through donation				0.011	0.011
				(0.016)	(0.017)
Feel good after donating				0.031**	0.031**
				(0.014)	(0.016)
Fear of needles					-0.013
					(0.013)
Fear of test results					0.010
					(0.016)
Transportation cost					0.030*
					(0.016)
No donation site					-0.023
					(0.016)
Not eligible					-0.013
					(0.016)
Constant	0.171***	0.278***	0.216	0.126	0.104
	(0.050)	(0.083)	(0.138)	(0.158)	(0.190)
Observations	1009	805	766	748	695
R-squared	0.046	0.159	0.161	0.168	0.171

Notes: The dependent variable equals one if the respondent reported having previously donated blood. Each column reports a linear probability model. Male, Muslim, and mud housing are omitted reference categories where applicable. Perception, motivation, and barrier measures were administered to all respondents using five-point Likert scales. The sample size declines across specifications because of missing responses for additional covariates. Standard errors in parentheses. Estimates represent descriptive associations and should not be interpreted as causal effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Across all specifications, women were approximately 14-16 percentage points less likely than men to report prior blood donation. This difference may reflect biological and clinical eligibility criteria, social norms, household responsibilities, differential exposure to recruitment, or other unobserved factors. The survey cannot distinguish among these mechanisms.

Respondents with more children and those with internet access were likely to report prior donation, conditional on other observed characteristics. These relationships may reflect family

health needs, kinship obligations, information exposure, urban proximity, social connectivity, or other socioeconomic characteristics.

Agreement with the statement that the respondent feels good when donating blood for others is positively associated with reported prior donation. Because this item was administered to both prior donors and non-donors, it should be interpreted as a stated attitude toward donation rather than as a measure of realized post-donation satisfaction alone. This association is consistent with warm glow or intrinsic benefits, but it does not establish an intrinsic-motivation mechanism.

Agreement that transport costs are a barrier is also positively associated with prior donation in the fully adjusted specification. This result should not be interpreted causally. Prior donors may have greater direct experience with the costs of reaching blood-donation sites, and the measure may capture knowledge of the donation process rather than a barrier that prevents all prior donation.

Because self-reported prior donation may include family/replacement donation, organized blood-drive participation, and compensated or informal donation, these estimates should be interpreted as associations with reported donation history rather than with voluntary, nonremunerated donation alone.

Appendix B. Supplemental Institutional Background

B.1 Clinical Need for Blood and the Wider Health System Context

The appendix provides additional institutional, clinical, and health system context for the experimental analysis. The main text focuses on blood drive attendance and the design of incentives. The discussion below documents why access to safe blood remains an important policy concern in Sierra Leone and other low-resource settings.

The material in the appendix is not intended to imply that increasing donor attendance alone will solve blood shortages. A functioning blood system also requires reliable collection materials, trained staff, laboratory testing, storage, transport, and distribution to facilities where blood is needed.

Socioeconomic and Health System Context

The demand for safe blood and blood products in Sierra Leone is substantial and is driven by a range of conditions for which timely transfusion is often lifesaving. Obstetric hemorrhage, severe childhood anemia, trauma, sickle cell disease and other hemoglobinopathies, and road traffic injuries account for a significant share of the country's transfusion needs. Understanding these major sources of demand provides important context for the persistent gap between blood supply and clinical need and underscores the potential health benefits of expanding the availability of safe blood. The following subsections describe the principal conditions contributing to transfusion demand in Sierra Leone and illustrate why strengthening the national blood supply remains a public health priority.

Maternal Mortality and Hemorrhage: Sierra Leone and Africa in a Global Context

Perinatal hemorrhage (hemorrhage around the period of labor and delivery) is a leading cause of maternal mortality in the world, consisting of 94 percent of maternal deaths, mostly in low and middle-income countries. In 2017, 295,000 women died from pregnancy-related causes; 94% of these deaths were in low-resource settings, and 86% were in Africa and Southern Asia (James et al. 2022). Similarly, in 2020 (the latest available data), 287,000 women died from pregnancy-related causes, a slight decrease from 2017. Seventy percent of these deaths occurred in countries south of the Sahara, and 16% occurred in South Asian countries. Most of these maternal deaths were due to perinatal hemorrhage and the lack of blood for transfusion and/or the low number of skilled medical staff during childbirth ("Trends in Maternal Mortality 2000 to 2020," n.d.; Cresswell 2023).

Globally, maternal mortality ratio (maternal deaths per 100,000 live births) remains high and is disproportionately elevated in low-income and fragile states. Between 2000 and 2020, North African and East African countries reduced their maternal mortality ratios by approximately one-third ("Maternal Mortality," n.d.). By contrast, West African countries, like Sierra Leone, continue to have the highest maternal mortality ratio among Sub-Saharan African countries ("2021 Report," n.d.), although substantial variation exists across countries within the region.

Sierra Leone, in particular, records maternal mortality ratios well above global and regional averages and ranks among the highest worldwide. The 2019 Sierra Leone Demographic

Health Survey documents 717 maternal deaths per 100,000 live births. In a similar vein, analysis using data from the Sierra Leone Maternal Death Surveillance and Response system indicates that perinatal hemorrhage (primarily postpartum [period after delivery] hemorrhage) is the leading cause of maternal mortality in Sierra Leone (Shafiq et al. 2024; *Sierra Leone Demographic and Health Survey 2019 [FR365]*, n.d.). Timely and adequate availability of blood and blood products for resuscitation of patients experiencing hemorrhage during childbirth and other medical emergencies could substantially reduce maternal morbidity and mortality.

Infant Mortality and Anemia: Sierra Leone and Sub-Saharan Africa in a Global Context

Infections (e.g., pediatric-associated malaria, neonatal sepsis, and digestive and respiratory diseases) are among the top three causes of infant mortality in the African region; these infections may lead to anemia, which may require blood transfusions. A child born in an African country in 2022 was 11 times more likely to die during the first month of life, as compared to a child born in Australia or New Zealand in the same year ("Newborn Mortality," n.d.). Amenable (preventable) mortality in younger age groups is more responsive to technological advancements and medical interventions, including the adequate supply of blood and blood products for transfusion.

In 2019, under five years of age mortality represented more than 22 percent of all deaths in the African region. The leading cause of neonatal deaths (0–28 days age group) in the region was birth asphyxia and birth trauma, followed by preterm birth complications and neonatal sepsis and infections ("WHO AFRO iAHO | Blogs Details," n.d.). In low-income countries, up to 65 percent of blood transfusions are given to children under five years of age, while in high-income countries, the most frequently transfused patient group is over 60 years of age, accounting for up to 76% of all transfusions (WHO, 2021). Barro et al. note that in resource-limited settings, children under five years of age receive up to 65% of the total share of blood transfusions (Barro et al. 2018). Sierra Leone's infant and under five mortality rates are 55 and 90 deaths per 1,000 live births, respectively. They are among the highest infant and under-five mortality rates in the world ("Sierra Leone (SLE) - Demographics, Health & Infant Mortality," n.d.).

Hemoglobinopathies: Sierra Leone and Sub-Saharan Africa in a Global Context

Among the various hemoglobinopathies, sickle cell disease is most prevalent globally, with the highest concentration of affected individuals residing in Sub-Saharan Africa (Thomson et al., 2021). Due to limited treatment options in the region, individuals with sickle cell disease require frequent and lifelong blood transfusions. The cause-specific sickle cell disease mortality rates among children under five years have been estimated to reach as high as 90% in some settings (Grosse et al. 2011; Wastnedge et al. 2018).

The high burden of sickle cell disease in Africa has been attributed to an evolutionary adaptation, whereby the sickle cell trait confers partial protection against Plasmodium falciparum malaria (Haldane 2010). The Anopheles mosquitoes that transmit the malaria parasite are widespread across the African continent. Sickle cell disease results in the production of abnormally shaped red blood cells that are prone to hemolysis, which subsequently occlude blood vessels, leading to complications such as stroke, severe pain crises and elevated mortality among affected individuals.

In low-income settings, like Sierra Leone, most children affected by the condition die before reaching adulthood. Many advanced treatment options are not available, and blood transfusion, together with antibiotics to prevent and to treat sickle cell associated infections, are the most feasible and cost-effective approach in managing the condition.

Road Traffic Injuries and Crashes: Sierra Leone and Africa in a Global Context

Road traffic injuries rank among the ten leading causes of death worldwide and constitute the leading cause of mortality among young people aged 15–29 years old (Chen et al. 2019). In addition to fatalities, road traffic crashes result in an estimated 20 - 50 million non-fatal injuries annually, many of which lead to long-term disability.

African countries bear a disproportionate share of the global burden of road traffic mortality, with a fatality rate of approximately 27 per 100,00 population, which is three times higher than Europe's average of 9 and well above the global average of 18. The continent contributes nearly one-quarter of global road traffic fatalities. Road traffic injuries are the leading cause of youth mortality in the region ("UNECE Annual Report 2023 | UNECE," n.d.).

Like many countries in the region, Sierra Leone experiences high rates of traffic-related injuries and deaths. Traffic laws and enforcement mechanisms are generally weak. In many places of the country, there are no traffic lights, and motorists often fail to yield to pedestrians.

Even where designated pedestrian crossings exist, drivers frequently do not give pedestrians the right of way. Informal traffic norms tend to prevail: smaller vehicles, commercial kehkehs (auto-rickshaws), and motorcycle taxi services typically yield to larger trucks and heavy vehicles, while pedestrians are expected to yield to virtually all moving objects. Children are often seen asking adults for assistance in crossroads. Many motorists are unlicensed, paying bribes to traffic police in order to operate. Police checkpoints are typically situated on major highways across the country, where it has become customary to see officers collecting bribes from motorists. Law enforcement often fails to document or enforce traffic violations, leading to unsafe conditions on the roads. Passengers frequently plead with commercial motorists to slow down, or they engage in religious rituals, hoping for divine intervention. Consequently, fatal traffic crashes are all too common. Strengthening traffic regulations and enforcement mechanisms would help reduce preventable injuries and deaths.

Furthermore, mortality resulting from road traffic crashes could potentially be reduced if medical facilities were equipped with adequate resuscitation fluids, including blood and blood products, as well as highly trained medical personnel to render timely emergency medical services. While the training of competent medical staff is costly and requires substantial time investments, the procurement of other resuscitation fluids and blood/ blood products is relatively less expensive and, in some cases, can be sourced locally.

Collectively, the high burden of obstetric hemorrhage, severe childhood anemia, trauma and surgical care, and hemoglobinopathies underscores the critical importance of strengthening Sierra Leone's blood supply. However, there are also structural factors that impact blood availability.

Structural and Institutional Barriers Contribute to Low blood Supply

The institutional and structural factors contributing to shortages of blood and blood products vary across countries. These include the physiologic degradation and limited shelf life of whole blood (partly due to limited capacity to separate whole blood into components with longer shelf lives), inadequate infrastructure for blood collection and storage of blood, and inadequate recruitment and retention of blood donors.

Furthermore, logistical barriers, such as hard-to-reach areas for collection and distribution of blood and blood products, cold chain constraints, relatively high transportation costs, armed conflicts and civil unrest, and the low density of trained healthcare workers in rural areas - further exacerbate shortages. Social and cultural factors, including religious considerations and skepticism toward the use of blood and blood products, also play a significant role. Financial constraints faced by governments also contribute to persistently low levels of blood collection and availability.

Even under optimal conditions, blood and blood products have limited storage durations. Whole blood can be stored for up to 35 days, platelets for up to five days, and plasma for up to one year. In suboptimal environments with limited storage capacity, collected blood and blood products degrade more rapidly, further constraining supply.

Inappropriate clinical uses of blood, such as non-clinically indicated overconsumption of blood products, are also prevalent in many clinical facilities. However, even when transfusions are clinically indicated, and there are adequate medical facilities, trained medical personnel, and storage capacities, donor recruitment and blood collection often remain insufficient to meet demand. The persistent gap between the supply and demand for blood and blood products, particularly among populations with the greatest need, highlights the necessity for a new paradigm to marshal evidence and inform policy.

Expanding the availability of safe blood and blood products has the potential to reduce avoidable morbidity and mortality among some of the country's most vulnerable populations. Hence, identifying effective, safe and ethically acceptable strategies to increase voluntary blood donation remains an important health priority. Given the persistent shortage of blood and the institutional constraints facing Sierra Leone's blood system, a key policy question arises: can donor incentives be implemented safely to increase the blood supply?

B.2 Sierra Leone: Socioeconomic and Blood-System Context

Sierra Leone: Socioeconomic and Demographic Context

Economists have long debated the causes of low economic output in Sub-Saharan Africa and in other low-income settings and the resulting poor social conditions faced by these populations (Gallup et al., 1998; Sachs, 2001; Acemoglu et al., 2002). Rodrick et al. contend that institutions

rule, that is, the humanly devised guiderails that define societal interaction (North, 1990), determine levels of poverty or wealth. Rodrick et al. suggest that poor economic conditions in poor countries are the result of weak or bad institutions (Rodrik et al. 2004). However, analysis from this project demonstrates that multiple factors interact to generate the adverse social and health conditions observed in Sierra Leone, a very low-income country. The lack of resources, poor institutional arrangements and other socio-cultural factors impact human health and well-being in multiple ways.

As of 2024, Sierra Leone's population was estimated at 8.64 million, and its gross domestic product (GDP) per capita was $806.7 (World Bank, 2026). Approximately 75% of the country's population is under 35 years of age, and only 66% and 12% of these youths have completed primary and secondary education, respectively (Adhikari et al., n.d.). According to the World Bank's social indicators, 41.5 percent of Sierra Leone's population lived below the poverty line of US$3.00 per day (2021 purchasing power parity) in 2018, and the annual population growth rate was 2.1 percent in 2024 (World Bank Open Data, n.d.).

In 2020 (2025 report), Sierra Leone's Human Development Index (HDI), an indicator of the expected productivity of a child born today, given prevailing health and education conditions relative to a standard benchmark of full health and complete education, measured 0.4 on a scale from zero to one (World Bank Open Data, n.d.). By comparison, the average HDI for African and OECD countries is approximately 0.55 and 0.916, respectively. With respect to HDI ranking, Sierra Leone ranks 185 out of 193 countries ("Home | Human Development Reports," n.d.). Life expectancy at birth was estimated at 62 years in 2023 (World Bank Open Data, n.d.). In 2021, the under-five mortality rate stood at 104.7 deaths per 1,000 live births (US Centers for Disease Control, 2023).

These social indicators suggest poor social well-being and widespread economic hardship. Our qualitative study confirms this assessment. Citizens reported widespread hunger and food insecurity, as well as a lack of resources to secure basic necessities. Furthermore, tight monetary policies and other constraints make commercial loans prohibitively expensive. Due to limited industrialization and low human capital development, youth unemployment and underemployment are estimated to be between 65% to 70% (*ILOSTAT Home* 2019). Many citizens engage in subsistence farming, highly saturated petty trading and commercial

motorcycle taxi services. These conditions may limit households' ability to absorb income shocks, transport costs, and temporary reductions in work capacity.

Blood Donation System in Sierra Leone

The National Safe Blood Service (NSBS) of Sierra Leone is a centralized institution which oversees the recruitment and collection of blood for national usage. The NSBS supervises 27 public and private blood transfusion centers (NSBS, 2023). To ensure blood safety, all donated blood and blood products are tested for key bloodborne pathogens, including human immunodeficiency virus (HIV) (types 1 and 2), hepatitis B virus (HBV), hepatitis C virus (HCV), and syphilis. Only blood units that test negative for these pathogens are approved for clinical use.

Across West Africa, transfusion-transmissible infections continue to pose a serious challenge to blood safety (Yambasu et al. 2018). Barro et al. (2018) highlight that in the African region, there are safety concerns related to the higher prevalence of HIV, malaria, and other bloodborne infectious diseases and the threat of emerging pathogens. In Sierra Leone, the estimated prevalence of HIV among the adult population was 1.4% in 2022 (US Centers for Disease Control, 2023).

Data on the prevalence of chronic viral HBV and HCV in Sierra Leone remain limited. However, Lakoh et al. synthesize findings from several small studies conducted over recent decades, which suggest a high prevalence of HBV and HCV among various sub-populations. Their estimates indicate an HBV prevalence of 16.7 percent among school-age children, 15.2 percent among blood donors, 11.3 percent among pregnant women, and 8.7 percent among healthcare workers. The prevalence of HCV is estimated at 8 percent in male blood donors, 7 percent in female blood donors, and 4 percent in people living with HIV (Lakoh et al. 2021).

Sierra Leone has also experienced political instability and a civil war in the recent past. The country's healthcare system is recovering from the largest regional Ebola epidemic (2014-2016) and the recent global COVID-19 pandemic. These instances of civil unrest and health crises have adversely impacted the health system, as resources were diverted from healthcare and other social sectors to address these emergencies. Resources are scarce, and the health sector

competes with other sectors for funding. The need for an improved healthcare delivery system and health outcomes is immense.

Health facilities lack basic necessities to provide care for the sick, and corruption within the healthcare sector is rife. There is a widespread lack of basic blood collection materials, such as hand gloves, alcohol, cotton swabs, blood bags, screen kits, hemoglobin testing kits, reliable transportation for conducting community blood drives, and adequate staffing. Blood banks at referral hospitals are expected to operate 24/7, yet only three to four blood bank staff members are pin-coded (government-employed staff). Voluntary staff are expected to work for years or even more than a decade before transitioning to pin-coded staff. These "volunteer staff" are expected to obtain financial compensation through tips from patients and their relatives, NGO partner agencies, and other informal channels. At some blood banks, volunteer staff sell soft drinks, water, snacks and test kits to family members who come to provide replacement donations for their relatives. Brewages for sale are stored in government/NGO-allocated refrigerators at blood banks.

Healthcare services are expected to be free at the point of delivery; however, in reality, patients and their relatives often pay for services at every turn in the care provision chain. Outside of serious emergencies, blood banks across the country will only provide blood for patients if the patient brings two or more individuals to donate blood. In focus group discussions, community members from across the country contend that they buy blood for their relatives when in need. Some blood bank staff complain that nurses at maternity and other hospital wards tell patients and their relatives to give money in exchange for blood in non-emergency cases, while informing blood staff that the situation is an emergency and requires immediate blood without the need for a replacement donor. These and other situations have created widespread distrust between patients and care providers.

Officially, the sale and purchase of blood are prohibited in Sierra Leone. The two primary acceptable types of blood donors in Sierra Leone are VNRDs and FRDs. However, the dominant type of donation is FRDs (Tognon et al., 2020). During our fieldwork for this project, we visited nearly all referral hospitals in the country and conducted both formal and informal conversations with senior hospital administrators, blood bank staff, and other hospital personnel. We documented that FRD is the primary method of maintaining blood flow into blood banks. Commercial donors also play a significant role in maintaining the blood supply. Blood supply is

limited while demand is high. These inefficiencies within the healthcare sector, combined with the severe liquidity constraints faced by ordinary citizens, expose them to an exacerbated risk of untimely deaths and prolonged morbidity.

Appendix C: Supplemental Experimental Design Materials

C.1 Information Messages

The following messages were delivered in English and Krio in districts assigned to the corresponding information environments: baseline (4 districts), narrative (3 districts), and Statistical (3 districts).

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Information Sets: Neutral, Statistical, and Narrative (in English and Krio)

Baseline information	People can donate blood every four months for women and every three months for men. [Pipul dɛm kin donate blood inside any 4 months for women en man dɛm kin donate blood after any 3 months]
Information set 1 (statistical lives)	Your blood donation today is important and could potentially benefit three people. [U blood wae u go donate tiday e fine tay en e go even benifit 3 pipul dɛm]
Information set 2 (narrative lives)	Your blood donation today is very important and could save the lives of thress pregnant women and their unborn babies, or other people in urgent need of blood. For example, in Kenema District, a mother rushed her sick two-year-old daughter to the hospital. She was told by the doctors that her child's condition was critical and that the child needed blood. Her older daughter shared the story on Facebook. A healthcare worker happened to read the post and coordinated voluntary blood donation at the local government hospital. This blood donation saved the child's life. Blood donation saves lives. [U blood wae u go donate tiday e fine tay en e go even benefit 3 belleh woman dɛm en d pikin wae day inside dɛm bɛlleɛh, Or other pipul dɛm wae day in need of blood.

	Fɔ example, inside Kenema district wan mama rush wit e sick girl pikin wae na just 2 years old na d hospital, D doctors dɛm tɛll am say e pikin e condition nor fine at all en d pikin e body need blood. D mama e big girl pikin bin get for send d story na Facebook. Wan health care worker bin get for see d post en e arrange wit pipul dɛm wae gree fɔ donate dɛm blood na d local government hospital. Dis blood donation ya bin save d pikin e life.]

Appendix Table C1. Information Assignment and Follow-Up Completion by District and Community

District	Information assignment	Communities	Initial Incentives assignment	Completed follow-up	District Completed
Bo	Statistical	Bendu Grima Tikonko Gondama Mamboma	Control 2 GB Meal 5 GB	Yes Yes Yes Yes	Yes
Bombali	Neutral	Kamabai Mapaki Red Cross Rokonta	5 BG Meal Control 2 GB	No No Yes No	No
Kambia	Narrative	Kukuna New London Red Cross Area Rogreray	5 GB 2 GB Control Meal	No No No No	No
Kenema	Neutral	Borma 3 Combema Kretema Konabu	5 GB Control 2 GB Meal	Yes Yes Yes Yes	Yes
Koinadugu	Statistical	Bilimaia Heremakono Kabala Central Mango Stick	2 GB Meal 5 GB Control	No No No No	No
Kono	Neutral	Jaiama Nimikoro Jaiama Sewafe Kensey Sukudu	Meal 5 GB 2 GB Control	No No No No	No
Moyamba	Narrative	Kebbie Town	Control	Yes	Yes

		Koromboya Section Salina Shenge Park Attaya	5 GB Meal 2 GB	Yes Yes Yes	
Port Loko	Neutral	Central Port Loko City Gbere Junction Gbonkoh Kareneh Old Port Loko	Control 5 GB Meal 5 GB	Yes Yes Yes Yes	Yes
Western Rural	Narrative	Matinde Tombo Waterloo Tisana	Control Meal 2 GB 5 GB	No No No No	No
Western Urban	Statistical	Calaba Town Kuntorloh Moa Wharf Portee	5 GB Meal Control 2 GB	No No No No	No

Notes: Ten districts were randomized to one of three information environments: baseline information (four districts), narrative-beneficiary information (three districts), or statistical-beneficiary information (three districts). At the time of analysis, Round 2 outcome data were available for four districts: Bo, Kenema, Moyamba, and Port Loko. The remaining districts had not completed follow-up fieldwork. The information analysis is therefore exploratory.

Appendix D: Robustness and Supplemental Estimates

D.1 Experiment 1 including Bombali District

Appendix Table D1. Effects of Noncash Incentives on Attendance including Bombali District

	(1) Attendance	(2) Continuous Incentive Value
Full meal incentive	3.125	
	(4.822)	
8 gigabyte incentive	7.625	
	(4.834)	
20 gigabyte incentive	11*	
	(6.118)	
Incentive value (Leones)		0.0262**
		(0.0126)
Constant	5.062	6.444*
	(5.103)	(3.504)
Observations	32	32

R-squared	0.447	0.429

Notes: The unit of observation is the community. The outcome is blood-drive attendance, defined as the number of individuals who presented, registered, and completed initial eligibility. All specifications include district fixed effects. This table includes the four Bombali communities that are excluded from the main Experiment 1 attendance specification because the Bombali control community was substantively atypical. Robust standard errors in parentheses. The omitted incentive category is the control group. * p < 0.10, ** p < 0.05, *** p < 0.01

D.2 Pooled Estimates Including Bombali

Appendix Table D2. Pooled Relationship Between Attendance, Incentive Value, and Incentive Type, Including Bombali District

	(1) Number attending blood drive	(2) Number attending blood drive
Incentive value (Leones)	0.0170	0.0274*
	(0.0156)	(0.0153)
Cash incentive		19.17***
		(6.027)
Experiment 2 indicator		-1.451
Constant	10.56***	4.651
	(3.856)	(3.707)
Observations	47	47
R-squared	0.218	0.481

Standard errors in parentheses
Robust standard errors in parentheses.
All specifications include district fixed effects.
The unit of observation is the community.
This appendix analysis includes Bombali district.
The outcome variable is community-level attendance at blood drives.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table D3: Wild-Cluster Bootstrap Sensitivity Analysis for Information Messages

Null	Clustering level	Bootstrap weights	p-values
Narrative information = Neutral information	District	Webb	0.652

Statistical information = Neutral information	District	Webb	0.811
Narrative information = Statistical information = Neutral information	District	Webb	0.200
Narrative information = Neutral information	District	Rademacher	0.500
Statistical information = Neutral information	District	Rademacher	0.750

Notes: Estimates use the locked sample of 245 initial attendees from Bo, Kenema, Moyamba, and Port Loko. The outcome equals one if an initial attendee was verified to attend the subsequent blood drive. The model includes indicators for initial incentive assignment and district-level information treatment. Wild bootstrap tests cluster at the district level. Because only four districts had completed follow-up, these results are reported only as sensitivity analyses. The primary inference for the information treatment uses exact randomization inference based on the original 10-district assignment mechanism.

Appendix E. Survey Instrument

Survey on Blood Donation

1Q1	Date of survey	mm/dd/yyyy

Section 1: Background Information

2Q1. What is your name?

2Q1	Name of participant	

2Q2. What is your phone number?

2Q2	Primary phone contact	

2Q3. What is your gender/sex?

2Q3	Gender/sex	

2Q4. How old are you?

2Q4	Age	

2Q5. How many times have you donated blood in the past (0 if never)?

2Q5	Total number of donations in the past	

2Q6. What is your marital status?

a	Single
b	Cohabiting (living with partner)
c	Married
d	Separated
e	Divorced
f	Widowed

2Q7. Do you have children?

a	Yes	Proceed to question 2Q8
b	No	Proceed to question 2Q9

2Q8. If you have children, how many children do you have?

2Q8	Number of children	

2Q9. What is your highest level of education?

a	I have never been to school
b	Primary school
c	Junior secondary school (O-Level)
d	Advanced secondary school (A-Level)
e	Trade/technical/vocational school
f	College (bachelor's degree)
g	Master's degree and above

2Q10. What do you do for work (occupation)?

a	Not employed (not generating any income)
b	Formally employed
c	Informally employed

d	Self-employed
e	Student
f	Retiree

2Q11. What is your monthly income in leones (Le)?

a	Le 0- Le 1000	Proceed to 2Q14
b	Le 1001- LE 2000	Proceed to 2Q14
c	Le 2001 - Le 3000	Proceed to 2Q14
d	Le 3001 – Le 4000	Proceed to 2Q14
e	Le 4001 – Le 5000	Proceed to 2Q14
f	Le 5001 – Le 6000	Proceed to 2Q14
g	Le 6001 – Le 7000	Proceed to 2Q14
h	Le 7001 – Le 8000	Proceed to 2Q14
i	Le 8001 – Le 9000	Proceed to 2Q14
J	Le 9001 – Le 10,000	Proceed to 2Q14
k	Le 10001 and above	Proceed to 2Q14
l	I am not sure	Proceed to 2Q12
m	I prefer not to say	Proceed to 2Q12

2Q12. What type of house do you live in?

a	Mud
b	Zinc
c	Wood
d	Concrete
e	Other

2Q13. Do you have the following in your home?

		Yes	No
a	Electricity		
b	TV		
c	Radio		
d	Tap water		
e	Internet		

2Q14. What is your ethnicity/tribe?

a	Temne
b	Mende
c	Limba
d	Loko
e	Fula
f	Mandingo
g	Sierra Leone Creole (Krio)
h	Sherbro
i	Kuranko
j	Kono
k	Susu
l	Kissi
m	Yalunka
n	Vai
o	Kru
p	Others

2Q15. What is your religion?

a	Muslim
b	Christian
c	Indigenous/traditional faith
d	Other religion
e	No religion

2Q16. Where is your permanent home or where have you been living in the past 5 years?

a	Freetown	Urban Cities
b	Bo	
c	Kenema	
d	Makeni	
e	Lunsar	
f	Port Loko	
g	Waterloo	
h	Kabala	
i	Segbwema	
j	Other	Non-Urban

Section 2: Blood Donation

3Q1. Have you donated blood in the past?

a	Yes	Proceed to 3Q2
b	No	Proceed to 3Q3

3Q2. If you have donated blood in the past, who did you donate the blood for?

a	Self
b	Family member
c	Friend
d	Neighbor
e	General blood drives
f	Other

3Q3. How did you hear about blood donation?

a	Social media
b	TV
c	Radio
d	From the town chief
e	Friend(s)
f	Family member(s)
g	Newspaper
h	School administrators/teachers
i	Schoolmates/classmates
j	Employers
k	Colleagues
l	other

3Q4. Perceptions of Blood Donation
1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

	Perceptions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
a	Blood donation can save the lives of others					
b	People who drink alcohol should not donate blood					

c	People who smoke should not donate blood					
d	Old people should not donate blood					
e	People with some illnesses should not donate blood					
f	Menstruating women should not donate blood					
g	Breastfeeding women should not donate blood					
h	Pregnant women should not donate blood					
i	Donating blood is bad for the donor					
j	People should not use donated blood					
k	Blood donation is associated with disease					
l	The blood donor is likely to get disease					
m	The blood recipient is likely to get disease					
n	A male blood donor may become impotent					
o	Blood donation is related to ritualistic practices					
p	There are health benefits to donating blood					
q	It is okay to sell blood					
r	It is okay to pay donors for blood					
s	If I or a member of my family needs blood, it is okay to buy blood					

3Q5. Motivators for Blood Donation
1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree/ Y= yes, N= No

	Motivators	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
a	I will donate blood to help a family member in need of blood					

b	I donated blood to help a family member					
c	I will donate blood to help someone in my community who is in need of blood					
d	I will donate blood to help a neighbor/ friend					
e	I will donate blood to save the lives of a pregnant woman and her unborn child					
f	I will feel good if I donate blood for others					
g	My family member(s) is a blood donor					
h	My family member(s) is a recipient of blood					
i	My friend(s) is a blood donor					
j	My friend(s) is a recipient of blood					
k	My religion encourages me to do good, including donating blood					
l	Blood donation makes my blood thin					
m	Donating blood is good for my health (donating blood will be good for my health)					
n	I wanted to know my blood type, so I donated blood (I want to know my blood type, so I will donate blood)					
o	I wanted to know if I have any disease, so I donated blood (I want to know if I have any disease, so I will donate blood)					
p	I donate blood because I receive some incentives (food, seeds, wristband, phone card, etc.)					

3Q6. Deterrents for Blood Donation
1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

	Deterrents	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5

a	I am afraid to donate blood because I am afraid of needles (I am afraid to donate blood because I am afraid of pain)					
b	I am afraid to donate blood because I don't want to know my blood test results (HIV, Hepatitis, other STIs, etc.)					
c	I am not eligible to donate blood					
d	I do not eat enough to be able to give blood					
e	I am not healthy enough to give blood					
f	My religion prevents me from donating blood					
g	The transportation cost for me to reach a blood drive/hospital to donate blood is too high					
h	I do not have time to go and donate blood					
i	I do not know where I can donate blood					
j	The medical staff are not friendly at blood drives (The medical staff are not friendly at blood donation centers)					
k	I am afraid that I will faint after I donate blood					
l	If I donate blood, I think that I might die					
m	I am afraid to see blood, so I don't go to donate blood					
n	The blood drives will sell my blood					
o	I do not want my blood to be given to someone from another religion					
p	I do not want my blood to be given to someone from another tribe					
q	I do not want my blood to be given to someone who has done bad things					

3Q7. Financial compensation for blood donation

1= Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

	Tradeoff/Compensations	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5

a	I would need to skip work or other income-generating activities to go to donate blood.					
b	I would need to miss school or other training activities to go to donate blood.					
c	I would need to skip religious activities to go to donate blood.					
d	I have other commitments that prevent me from donating blood.					
e	If offered, I would accept money for donating blood.					
f	I would accept other forms of compensation, but not money, for donating blood.					
g	If I were compensated with money, I would be willing to donate blood.					
h	If I were compensated with money, I would donate blood frequently.					
i	If I were compensated with money, I would find time to donate blood.					

Thank you very much for your time!

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