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Can Information and Alternatives to Irregular Migration Reduce "Backway" Migration from the Gambia?

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Abstract *(required)*

Irregular migration from West Africa to Europe across the Sahara and Mediterranean is extremely risky for the migrants and a key policy concern. A cluster-randomized experiment with 3,702 young men from 391 settlements in the Gambia will test three different approaches designed to reduce risky, irregular migration. The first is to provide potential migrants with better information about the risks to be faced during the journey, including testimonials from those who have attempted the journey and statistics on the likelihood of experiencing negative events en route. The second intervention is to also provide a second safer migration alternative, by adding information and assistance for migration to neighboring Senegal. The third approach is to provide an alternative path at home, by providing vocational skill training in addition to the information about irregular migration. Key outcomes will be actions towards migrating the "backway", migration to Senegal, and overall well-being.

1. Introduction

Research question: background, importance and relevance

Irregular migration to Europe has become increasingly visible in recent years. According to the European Border Agency (FRONTEX), almost 3 million irregular migrants have been detected crossing European borders since 2015. Despite this being a relatively small number compared to the size of the EU population (less than 1%), the images of young African men on crowded rubber boats in the Mediterranean Sea have put the phenomenon under the spotlight in a context of growing electoral support for European political parties running on nationalist anti-immigration platforms. In addition to being a topic of key policy interest in Europe, there are importance consequences for economic development in Africa. First and foremost are the potential consequences of this journey for the migrants themselves, who face risks of human rights abuses and loss of life. The most common way for youth to migrate from West Africa to Europe is through what is referred to as the "backway". This describes an overland journey through West Africa, across the Sahara desert, and into Libya, from which youth attempt to catch boats to Italy and other European destinations, with each stage involving multiple risks. More broadly, the potential of migration and remittances to help alleviate poverty and drive economic development in sending countries (e.g. Clemens, 2011) will not be realized, or will be greatly reduced, if potential migrants die along the way or face vulnerable conditions in the destination countries that limit their earnings.

The key research question this study seeks to address is whether providing an information intervention and offering alternatives to irregular migration will reduce the likelihood of backway migration, spur migration to alternative destinations, and improve well-being of potential migrants. It will do this by means of a randomized experiment in the Gambia.

Although deterring irregular migration is desired by European countries, revealed preference would suggest that the migrants themselves believe they are improving their lives by making this journey, raising the question of whether policy efforts to deter migration are desirable from a development perspective. There is indeed a vast literature showing that international migration in other settings has been more effective at increasing the incomes of poor people than almost any other development policy (e.g. McKenzie et al, 2010, Clemens et al, 2019). Moreover, the income gaps between West Africa and Europe are huge, with per-capita GDP in 2018 in Gambia of $713 only two percent of Italy's $34,319[1]. While this suggests large potential gains from migration, revealed preference may still be suboptimal if potential migrants are misinformed about the severe risks of the migration journey and the outcomes they face upon arrival.

[1] Source: World Development Indicators (2019).

West African irregular migrants to Europe typically travel through the Sahara desert in crowded open trucks (from which they often fall and are left behind to die) to get to Libya, where they face a variety of serious challenges, including abductions for ransom, slavery, torture and other ill-treatment.[2] Considering the additional risks of drowning in the Mediterranean, having the smuggler boat caught and being brought back to Libya,[3] and being deported upon arrival in Europe,[4] results in an estimated overall 4% success rate of attempted backway migration journeys.[5] Moreover, the reported risks of travelling the backway have been increasing in recent months for several reasons: in addition to a worsening political situation in Libya, changes in European migration policies have made it more dangerous to attempt the crossing, and less likely to get asylum status when crossing successfully. As a consequence, the Washington Post reports that the share of migrants leaving Libya who reached Europe fell from 78 percent in January 2017 to 45 percent in June 2018 (Harlan, 2018). On top of this, deportation rates from Europe have increased dramatically. The relatively recent increase in this risk, combined with the longer-term tendency of migrants to over-inflate how successful they have been abroad, may result in many Gambian youth having overly optimistic expectations about both the ease of migrating to Europe, and the conditions they will face once they get there.

Notwithstanding these risks, the irregular emigration rate from the Gambia to Europe was nearly 0.5% of the country's population in 2017, making it the African country with the highest incidence of irregular migration relative to its total population (see Figure 1). This suggests that a lot of Gambians perceive significant net gains from migration and believe they can improve their lives by making this journey. However, news of worsening irregular migration risks and outcomes is unlikely to quickly reach potential migrants in the isolated poor rural areas of Gambia where migrants typically come from. In addition, evidence provided by Shrestha (2019b) shows that Nepalese migrant decisions appear to be overly

[2] Numbers on the death rates of irregular migration from West Arica to Italy through the Central Mediterranean route are very scarce and hence have limited reliability. According to our calculations combining the evidence collected by the North Africa Mixed Migration Hub (MHub) with the existing numbers on death rates in the Mediterranean, 22% of those attempting to cross the Saharan desert and other transit countries to reach Libya died in the process. Of those who reached Libya successfully, another 23% died mostly due to physical violence. http://www.mixedmigrationhub.org/wp-content/uploads/2017/02/Italy-MHub-Survey-Snapshot-Jan-2017.pdf [Last accessed on July 23, 2019.]

[3] Respectively 7.6% and 46.7% of crossing attempts, according to a report by the Washington Post: https://www.washingtonpost.com/world/europe/fewer-migrants-are-making-it-to-europe-heres-why/2018/07/23/80b56082-8c57-11e8-9d59-dccc2c0cabcf_story.html?utm_term=.b55d2511d50e [Last accessed on July 23, 2019.]

[4] According to the Eurostat, in 2017 the probability of being deported upon irregular arrival to Italy from Gambia was 57.6%. However, this deportation rate increased very strongly, reaching 86.6% in the last quarter of 2018, according to the Eurostat. These updated numbers were used as a component of the information and deterrence intervention we implemented.

[5] The 4% success rate is a lower bound that we used in the absence of information on multiple Mediterranean crossing attempts. Note that even if migrants attempted to cross the Mediterranean one more time after being brought back to Libya, their overall success rate would still be only 5%.

responsive to recent migrant deaths in their district, suggesting that they have difficulty learning the true risk of death and update too much based on small samples. This overall context suggests a role for information interventions in providing accurate information on the risks and outcomes of irregular migration.

Even if migrants understand the risks and are making informed migration decisions, these may only be optimal because of a feeling of hopelessness and a lack of options at home. This suggests a further role for policy interventions that change the next best option that potential migrants are comparing irregular migration to.

This research design is motivated by and will make contributions to several literatures. A first general point is that there are substantial knowledge gaps about irregular migration from West Africa to Europe, with few large-scale surveys to provide even descriptive evidence on this phenomenon, nor examples of panel data attempts to interview individuals before these journeys and then track who migrates. We believe the basic descriptives from this project will therefore serve as a first contribution to better understanding this migration flow.

The first main contribution to the literature then concerns the role of information in migration decision-making, and the effectiveness of information campaigns in changing migration decisions. The relevance of information asymmetries in the context of transnational households has been documented in the economics migration literature, highlighting that information flows between (mostly legal) migrants in developed countries and their networks in the countries of origin are less than perfect (McKenzie et al., 2013; Ashraf et al., 2015; Batista and Narciso, 2018). We argue that lack of information by potential migrants is likely to be more serious - and increasingly so - in the context of irregular migration from Africa to Europe: de facto European immigration policy changes happen almost every week and information flows to isolated rural areas are scarce.[6]

A few recent contributions have used randomized controlled trials to investigate the role of information in migration decisions (Bryan et al, 2014; Beam, 2016; Beam et al, 2016; Shrestha, 2019a; Baseler, 2019). Generally, the aim of these studies was to assess to what extent the provision of information facilitated migration in contexts where mobility is low despite being welfare-enhancing. What is made clear from this literature is that information matters both in internal and international migration contexts, and that lack of information contributes to explain why migration from some areas remains at suboptimal levels. More

[6] The context in which migrants cross the Mediterranean sea is becoming increasingly riskier: currently migrant smuggler boats are most likely intercepted by Libyan army boats with migrants being kept in Libyan migration detention centers in vulnerable conditions, while humanitarian support has virtually disappeared from the Mediterranean, likely resulting in increased death risks, according to reports by the United Nations. https://www.theguardian.com/world/2019/jun/09/mediterranean-sea-of-blood-migrant-refugee-rescue-boats-un-unhcr [last accessed on July 23, 2019] https://www.france24.com/en/20190704-libya-un-security-council-attack-tajoura-libya-migrant-centre [last accessed on July 23, 2019] https://www.theguardian.com/world/2019/apr/25/libya-detention-centre-attack-footage-refugees-hiding-shooting [last accessed on July 23, 2019]

recently, lab-in-the-field experiments have also been conducted to investigate the role of various factors (among which information) in migration decisions (Batista and McKenzie, 2018; Barnett-Howell, 2018; Lagakos et al, 2018; Bah and Batista; 2018). These studies are also supportive of the hypothesis that information is an important driver of migration decisions in different contexts.

While most experiments have investigated to what extent providing information *facilitates* migration, information campaigns launched in Sub-Saharan Africa in recent years have mainly sought to *deter* migration, irregular migration in particular, by emphasizing the deadly dangers associated with it.[7] In 2019 alone, the European Union has launched six information and awareness raising campaigns on the risks of irregular migration - in Côte d'Ivoire, Niger, Tunisia, Mali, Guinea and The Gambia.

In the context of an incentivized lab experiment in rural areas of the Gambia, Bah and Batista (2018) find that the willingness to migrate irregularly actively responds to information about relevant information regarding costs and benefits of migration - namely declining with the probability of dying en route. There is, however, a lack of real world evidence on the effects that information campaigns have in this context. Tjaden et al. (2018) conducted a recent systematic review of 60 studies of information campaigns targeting potential migrants. They note most of these are in the grey literature, relying on small sample cross-sectional samples with no robust strategy for identification, with only 2 peer-reviewed studies. They conclude that while the majority of information campaigns claim to have been "successful" in inducing a change in knowledge, perceptions, attitudes or even intended behavior, these findings do not rely on rigorous identification designs, and that the goals of many campaigns are often vague, and restricted to "awareness-raising". Moreover, other work suggests that many information campaigns have had very limited effects on the decision to leave. Ethnographic work and case studies (Carling and Hernández-Carretero, 2008; Browne, 2015; Schans and Optekamp, 2016) highlight some reasons for these lack of impacts, including a lack of trust in information disseminated through mass-media campaigns, and they suggest that effectiveness may be higher if campaigns include real-life testimonies from returned migrants and also direct migrants to alternative legal opportunities. We take these lessons into account in designing our information interventions.[8]

A second main contribution will be to the literature on whether providing alternatives to irregular migration can reduce it. McKenzie and Yang (2014) survey the literature on evidence for policies to improve the development impacts of migration and find no examples of well-identified impacts of alternatives to irregular migration. In designing our two alternatives to backway migration, we therefore rely on a mix of related literature on migration facilitation, and on current policy efforts. The first alternative we consider is to

[7] Nieuwenhuys and Pécoud, 2007; Carling and Hernández-Carretero (2008, 2011).

[8] Since launching our project, a new study by Dunsch et al. (2019) reports on an IOM information campaign in Senegal that used return migrants as messengers, showing videos in town halls. They find this information did result in an increase in the likelihood that potential migrants were aware of the multiple risks associated with irregular migration, and reduced their stated intent to migrate irregularly in the next two years, but they do not track these individuals to see whether actual migration behavior changes.

facilitate legal migration to an alternative destination. Bryan et al. (2014) find that paying for a $8.50 bus ticket spurred significant rural-urban seasonal migration flows in the lean season in Bangladesh. It is less clear whether such an approach can succeed with international migration in an African context, although Gazeaud et al. (2019) find that cash transfers in Comoros did increase migration rates to the neighboring richer island of Mayotte, suggesting that alleviating financial constraints may facilitate regional migration.

The more popular policy alternative has been to try to reduce irregular migration by providing better job opportunities at home. The European Union (EU) has been funding large vocational training programs in West Africa with the explicit objective of addressing the economic root causes of irregular migration, namely by supporting youth employment and entrepreneurship.[9] However, to the best of our knowledge, no study to this date has examined whether vocational training and entrepreneurship interventions deter migration, or in fact promote it by giving youth marketable skills that they can use at destination.

2. Research Design

Intervention(s)

The study randomly assigns males aged 18 to 33 living in rural Gambian settlements (villages) to one of four different groups, with random assignment at the settlement level. We discuss the details of this clustered randomization strategy below, after describing how our sample was selected. The four different groups consist of three different treatment groups (information and deterrence; information and Senegal as a migration alternative; information and vocational training) and a control group, who are delivered the following interventions.

Treatment 1 (information and deterrence) consists of providing information about the risks involved in migrating irregularly to Europe. Information was conveyed in the form of a video documentary. All videos were dubbed into the three major languages spoken in the regions: Mandinka, Fula, and Wolof. Respondents were shown the videos in their preferred spoken language towards the end of the baseline survey on tablets. This way we could monitor and ensure the video was watched by each study participant in this treatment group. The video participants included members of an NGO, Youth Against Irregular Migration (YAIM) formed by failed irregular migrants to Europe, deportees, and Gambian irregular migrants residing in Italy. They narrated their individual migration experience en route to Europe. The main information conveyed included reasons for migrating, how they obtained information about the trip, duration of the trip, and experience during the trip including witnessing accidents, deaths, kidnapping and general advice to prospective migrants. The video documentary was supplemented with an animation video that conveyed facts about the migration journey. The facts include the average cost of the migration, duration of the trip, probabilities of dying en route, probability of obtaining residence/asylum status, and the chances

[9] In Gambia, for example, the EU started the Gambia Youth Empowerment Project (YEP) in 2017 through its Emergency Trust Fund for Africa. https://www.yep.gm/ [Last accessed on July 26, 2019.]

of being deported back to The Gambia. This information was gathered from reports published by North African Mixed Migration Survey (MHub, 2017) and the Washington Post. The reports document information on deaths of migrants along the route and the detailed reasons for the deaths, abuse and kidnapping incidences experienced by migrants through the Central Mediterranean Route. Information about residence/asylum status was obtained from Eurostat. Appendix A provides more detailed description of the content of the video, and example screenshots, as well as more details on the other interventions. The theory of change for this intervention is that it should affect migrant behavior largely through the provision of new information, as well as potentially through the inclusion of role models and through a salience effect.

Treatment 2 (information and Senegal alternative) was shown the same videos as the information and deterrence group, given additional information about migration to Dakar, Senegal, and offered financing and support to pay the cost of travel to Dakar. The information about Senegal was also conveyed through a video documentary towards the end of the baseline, including testimonies of Gambian migrants residing in Dakar. These migrants narrate their migration experience to Dakar, conveying information on the cost of migrating, type of job opportunities and earnings, and general advice to prospective Gambian migrants. Moreover, respondents in these settlements were provided with the opportunity to migrate to Dakar for free. They were asked if they were interested in migrating to Dakar for the purpose of looking for jobs. Respondents in this group were then given (i) a labelled cash transfer of 1200 GMD (about 20 Euros) that could be used to pay for the cost of a bus journey to Dakar[10]; (ii) information on the bus routes and timetables for travelling to Dakar; (iii) contact information for a representative of the Gambian migrant association in Dakar who could be asked any questions about travelling to Dakar and help connect them to opportunities upon arrival; and (iv) a Dakar voucher entitling the respondent to an additional 10,000 CFA (about 15 Euros) cash transfer upon arrival to Dakar (see appendix A3). Once in Dakar, this money could be obtained from the migrant representative, and is intended to be used to help cover the initial costs of establishing oneself in Dakar. However, it is also sufficient to pay for the cost of returning to the Gambia if needed.

There are several pathways through which this second treatment may influence potential migrant behavior on top of that of treatment 1. First, youth who are planning on migrating the backway may not respond to information about riskiness alone, in the absence of seeing viable alternatives to improving their lives. This intervention should increase the relative attractiveness of Senegal as a destination choice by providing more information about it, increasing its salience and including role models who have made this journey, and lowering the cost of trying this alternative.

[10] Our initial plan was to provide bus vouchers and a dedicated bus service to transport respondents to Dakar. However, this had to be amended because of the difficulties in coordinating transport across respondents, and to bus maintenance problems with our selected bus company. The provision of labeled cash corresponds to the approach used by Bryan et al. (2014) in Bangladesh.

Treatment 3 (information and vocational training alternative) was shown the same information as the information and deterrence group, and additionally given the opportunity to enroll in a tuition-free vocational skill training program. They were given leaflets (see appendix A4) that enumerated the list of courses and instructions on how to register for the training. The courses include building construction (block work), carpentry and joinery, electrical installation, plastering and tiling, plumbing and gas fitting, refrigeration and air conditioning, small engine maintenance and repair, and welding and fabrication. Those that were given the training vouchers were instructed to send text messages indicating the courses they wanted to be trained on. In collaboration with the Gambia Technical Training Institute (GTTI), the training is scheduled to start in November 2019 at the Julangel Skills Training Center, URR, and will last for six months. As with the Senegal alternative, the theory of change here is that providing a viable alternative to risky migration may change the cost-benefit calculation, as well as making youth more responsive to information on the risks.

Finally, the ***Control Group*** was shown a video that explains the importance of exclusive breastfeeding. The video was obtained from the National Nutrition Agency (NaNa). This video is not expected to have any effect on migration outcomes.

While it is impossible to blind youth to their interventions, we attempted to minimize the likelihood of Hawthorne/John Henry/experimenter demand effects by not telling subjects that this was an experiment, or that alternative interventions were being offered in other settlements. The baseline survey was described as a research study aimed at understanding the desires and needs of Gambian youth. Moreover, our main outcomes will be action-based outcomes that are less likely to be affected by any experimenter demand effects than could be the case for stated intentions and attitudes. We asked both the Senegal and vocational training group participants why they thought the intervention was being offered, and who they thought was behind it. The two main reasons seen for the interventions were to provide them with more job opportunities, and to reduce backway migration (See appendix A5).

Hypotheses

Primary Hypothesis*:* Our three treatments will reduce the likelihood of backway migration from the Gambia, increase the likelihood of migration to Senegal and internal migration, and improve the well-being of the young men in our sample.

We will test this primary hypothesis through measuring outcomes in three domains, where outcomes will all be measured in a follow-up survey to take place between March and September 2020, approximately one year after the intervention. The reference period for questions, unless noted otherwise, will be since the baseline survey of April/May 2019. In addition to referencing the baseline survey, we will fix this in their minds as “right before the start of Ramadan last year”.

Domain 1 (PHD1): Steps towards and acts of backway migration. We will measure impacts on the following outcomes:

1. *Number of steps taken towards migrating the backway:* the follow-up survey will ask if individuals have taken any of the following actions:
    a. Collected or saved the money they need to pay for travelling the backway
    b. Asked someone for help finding a job in Europe
    c. Asked someone for help finding accommodation in Europe
    d. Have mapped out the initial route they would take if they were to travel the backway
    e. Have made a plan on how they will travel to Europe

    This outcome will be a count variable from 0 to 5 for the number of these actions taken. It will be coded as 5 for individuals who have attempted migrating the backway (defined in outcome 2).

2. *Attempted migrating the backway:* the follow-up survey will ask (e.g. Appendix B) about all attempted moves out of the country since the baseline survey. This variable will be coded as 1 if the individual attempted to migrate to a European country (intended destination in M1.1 is Europe), and they did not use a visa (M1.4 not equal to 1). It will be coded as 1 also for those who are not able to be interviewed but who either shared a location along the backway with us using Whatsapp, or for whom proxy respondents report having gone the backway. It will be coded as 0 for those interviewed who did not attempt migration, and for those not interviewed for whom proxy respondents report still being in the settlement or having moved internally.

3. *Migrated to Europe:* this will be coded as 1 if the individual has migrated to Europe since the baseline survey, as reported either in their own survey responses, or by them sharing location using Whatsapp, or by proxy respondents reporting them to be in Europe; and 0 if they are interviewed outside of Europe and have not returned from there, or reported by proxy respondents or Whatsapp location-sharing to be outside of Europe.

Domain 2: Migration to Senegal and Internal Migration (PHD2). The Senegal migration alternative treatment is expected to increase migration to Senegal, while the vocational training treatment may increase internal migration to Banjul in search of skilled jobs. All three treatments may also increase these other forms of migration as substitutes for backway migration. We will measure the following outcomes.

1. *Migrated at all to Senegal since baseline:* This will be coded as 1 if the individual has migrated to Senegal since the baseline survey, as reported in either their own survey responses (see Appendix B, M1.1=7 & M1.7=1 or M1.7a=1), or by them sharing location in Senegal using Whatsapp, or by proxy respondents reporting them to have been to Senegal or to be in Senegal, and 0 if interviewed and they say they have not been to Senegal, or if reported by proxy respondents to not be in Senegal.
2. *Migrated to Dakar since baseline:* Since many Gambian youth migrate seasonally to nearby rural Senegal for agricultural work, we are separately interested in whether they go to Dakar, which is a

more major move. This will be coded as 1 if the individual has migrated to Senegal since baseline (outcome 1) and the destination in Senegal is Dakar, and 0 if not.

3. *Currently in Senegal:* Since seasonal and return migration from Senegal is more common, we will also measure whether they are currently in Senegal at the time of the follow-up survey. This will be measured as for outcome 1, except that those who have returned to Gambia or moved to another country will now be coded as 0.
4. *Migrated to Banjul since baseline:* This will be coded as 1 if the individual has migrated to Banjul, the capital city of the Gambia, since baseline, and 0 otherwise. This will be based on the location the youth is living at the time of the interview (Banjul or not), and a direct question on the follow-up survey of whether they have migrated to Banjul for a period of at least one month since the baseline survey.

Domain 3: Well-being (PHD3). All three treatments may increase well-being, through reducing the risks associated with backway migration, making migration appear less desirable and hence increasing satisfaction with current life, and through offering opportunities for higher income alternatives in Senegal and the Gambia. We will measure the following outcomes:

1. *Cantril ladder of life satisfaction:* This will be a measure from 0 to 10, from the question "Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. Suppose we say that the top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. If the top step is 10 and the bottom step is 0, on which step of the ladder do you feel you personally stand at the present time?"
2. *Experiences of violence, theft, and threats to life:* this will be measured as an index comprised of the average of standardized z-scores of yes/no questions of whether or not individuals have experienced any of the following since the baseline survey:
    a. Robbed of money
    b. Physical violence (beatings, torture, etc.)
    c. Arrest or imprisonment
    d. Threats against their life
3. *Monetary income from work:* total income earned from work in the past month from all sources including wage and salary work, casual and day labor, self-employment, and sales of agricultural production. Since this outcome is expected to have many zeros, and to be highly skewed, we will take the inverse hyperbolic sine transformation, after winsorizing at the 99^{th} percentile to reduce the influence of measurement error-related large outliers that can arise when comparing incomes from different sources. All income will be converted to Gambian Dalasi using the prevailing exchange rate in the month of survey.
4. *Overall well-being index:* This will be an index of standardized z-scores of outcomes 1-3 in this domain.

Secondary Hypotheses:

Secondary hypotheses examine the channels through which the intervention is expected to have an impact, as well as measuring impacts on additional outcomes of key economic and policy interest.

*Secondary Hypothesis 1 (SH1): The interventions will have short-term impacts on the **knowledge** individuals have about migrating the backway and about migrating to Senegal, their **beliefs** about the riskiness of migrating the backway, and their **intentions** to migrate the backway.*

These short-term impacts are measured using the baseline survey, by randomizing the placement of questions before or after individuals view the information video (see identification strategy below). A pre-analysis plan to cover these baseline measured impacts was uploaded to the AEA RCT registry on May 1, 2019, while the baseline survey was underway and prior to us receiving any baseline data. It includes examining the impact on the following outcomes.

1. *Europe backway knowledge:* this is measured as the number of correct responses (out of 5) to the following five questions[11]:
    a. How much does it cost to migrate from Gambia to Italy through the "backway"? (Answers in the range 100,000 to 250,000 Dalasi (approximately $2,000 to $5,000) considered correct).
    b. How many countries do you transit through when migrating through the backway (correct answer 4 countries).
    c. True or False: Some backway migrants are forced to work for others without being paid (correct answer True)
    d. True or False: Backway migrants without residence/asylum permits can be deported by the European Union (correct answer True)
    e. True or False: Gambian migrants migrating through the backway cannot travel without Gambian passports (correct answer False).
2. *Beliefs about the riskiness of the backway journey:* is measured as an index of standardized z-scores of the following questions:
    a. Number of migrants out of 100 who will not make it at least as far as Libya or Morocco (calculated as 100 minus the number they think will make it)

[11] Note that the backway knowledge and Senegal knowledge questions in our pre-analysis plan filed on May 1, 2019 do not exactly match the knowledge questions actually asked. We intended to update the knowledge questions to more closely capture the information contained in the information videos. However, the survey firm failed to implement this update to the knowledge questions, instead using the set of questions detailed here. As such, some of our knowledge questions ask about information that is not covered in the information videos, leading us to view any treatment effects on knowledge as a lower bound of whether treated individuals learned new information from the information intervention.

b. Number of migrants out of 100 they believe will get arrested or imprisoned before getting to Europe
c. Number of migrants out of 100 they believe will get attacked or robbed
d. Number of migrants out of 100 they believe will die on the way to Europe
e. Number of migrants out of 100 they believe will not make it to Europe (calculated as 100 minus the number they will make it)
f. Number of migrants they think will not be able to obtain residency or refugee status in Europe (calculated as 100 minus the number they think will get this)
g. Number of migrants who board a Mediterranean crossing they believe will not make it across the sea.

3. *Intention to migrate to Europe:* is measured by the percent chance they will migrate to Europe in the next year.
4. *Behavioral measure of interest in migration to Europe:* during the baseline individuals are given a number they can send an SMS message to receive information about the wages earned by recent Gambian migrants in Europe. This measure is a dummy variable taking value 1 if they text to ask for this information and 0 otherwise.
5. *Senegal migration knowledge:* this is the number of correct responses out of the following five questions:
    a. What is the typical monthly wage a Gambian migrant worker earns working in the construction sector in Dakar? (Answers in the range 6,000-9,000 Dalasi will be counted as correct)
    b. True or false: Gambians do not need a passport to travel to Senegal (correct answer True)
    c. True or false: Gambians are legally allowed to stay as long as they like to work in Senegal (correct answer True)
    d. True or false: Gambians can legally work in most jobs in Senegal without having to apply for a work permit (correct answer True)
    e. What is the cost of a bus ticket from your village to Dakar (answers in the range 800 to 1,500 Dalasi will be counted as correct).
6. *Intention to migrate to Senegal in the next year:* is measured by the percent chance they will migrate to Senegal in the next year.

Secondary Hypothesis 2 (SH2): The interventions will help correct over-optimism bias with this bias correction persisting over a year. Over-optimism will be measured as a standardized index averaging z-scores of the following variables to be measured during the follow-up:

1. *Wage over-optimism:* The individual over-estimates by 2 euros or more the wages earned by typical Gambian migrants in Europe. We will ask youth the daily wages of a Gambian migrant in Europe, and compare to the reports of average hourly wages of 2-3 euros per hour (112 to 168 Dalasi per

hour). Over-optimism on wages is a dummy variable taking value one if they expect a wage of 5 euros an hour or higher.

2. *Over-optimism on chance of getting asylum or refugee status conditional on applying:* statistics from 2018 show that more than 75% of asylum claims were rejected. We will therefore classify youth as overoptimistic about the chance of getting asylum or refugee status if they estimate 25% or more of those applying are approved.

Secondary Hypothesis 3 (SH3): If backway migration death rates are larger than anticipated, and the treatment has a large impact on reducing migration, then the interventions will also reduce migrant deaths. Our power to detect a 1.5 percentage point reduction in the death rate from an assumed control group mean of 3 percentage points is only 45 percent. We will therefore only examine migrant death rates as a secondary outcome if 5 percent or more of the control group die during backway migration, and if the treatment leads to at least a 40 percent reduction in backway migration.

Secondary Hypothesis 4 (SH4): the interventions will have longer-term impacts on intentions to migrate the backway, and on intentions to travel to Dakar. Since the use of percent chance questions proved difficult at baseline, we will measure these questions at our 1-year follow-up by asking their likelihood of moving on a 0 to 5 scale, where 0 = will surely not move, 1 = likely not to move, 2 = maybe not move, 3 = maybe move, 4 = likely move, and 5 = will surely move. We will measure:

1. Likelihood of moving to Dakar in the next five years. This will be coded as 5 for individuals already in Dakar.
2. Likelihood of taking the backway to Europe in the next five years. This will be coded as 5 for individuals already in Europe the backway, and 0 for individuals in Europe who travelled there legally.

Basic methodological framework / Identification strategy

This study is a cluster-level randomized experiment, where the level of intervention is the settlement (village). We discuss in the methodology section the planned estimation methods.

Data

Sample

Selection of settlements

The Gambia is divided into five administrative regions and the capital city area of Banjul. We selected the two Eastern-most regions of the Upper River Region (URR) with a population of 240,000; and the Central River Region (CRR) with a population of 226,000. These regions are remote, largely rural, and are at a driving distance of 300km or more from the capital city, and 450 km or more from Dakar, Senegal. These regions were chosen due to their high propensities of irregular migration and poor access to conventional

sources of information about migration. According to estimates from the 2018 Gambia Labor Force Survey, URR has the highest share of irregular migrants to working population of all regions (more than 5%), while in CRR about 3% of the population are irregular migrants. Most people work in agriculture, with limited alternative opportunities, making migration to Europe appear particularly attractive. Using estimated population sizes projected from the 2013 Gambian census, we identified settlements that were predicted to have at least 35 males aged between 18 and 30, and that had total population sizes below 3,000. We then used data from the 2015/16 integrated household survey to exclude two districts with the lowest shares of households receiving remittances, to ensure we focused on areas with higher likelihoods of migration. We then randomly selected 404 settlements from a pool of 580 eligible settlements to conduct a listing exercise. Figure 2 plots the settlements by treatment assignment (see below).

Selection of households and individuals

Settlements are divided into enumeration areas (EAs), consisting of at most 500 individuals (50 households), and most settlements consist of only one EA. We randomly chose up to 2 EAs per settlement and conducted a door-to-door listing exercise of all households in these 404 settlements to record whether they have at least one male aged 18 to 30. In addition, one village leader was surveyed in each of these settlements to elicit village level characteristics such as the fraction of households in the village that have a migrant in Europe, in Senegal, and in Banjul; whether any vocational training program had been made available in the village; the cost of a bus to Dakar from that village; and whether any information campaign against irregular migration had already been conducted in the village.

Listing took place March 26, 2019 to April 11, 2019 and listed 5,597 households with males aged 18 to 30 in the 404 villages. The baseline survey then took place between April 19, 2019 and May 18, 2019. Data collection was conducted in 391 settlements, after dropping 13 small settlements that had fewer than 4 eligible households. Within the eligible households, the baseline interview took place with a male 18 to 33. We focused on this age as the most at risk of migrating the backway. If the household had more than one male in this age group, the interview took place with the individual the household considered the most likely to migrate in the next five years. If the household had multiple males in this age range and said they were equally likely to migrate, or all unlikely to migrate, the interview took place with the person closest in age to age 22. If there were twins equally likely to migrate, then the instruction was to randomly choose one of them for the interview.

The final sample size interviewed is 3,702 individuals in these 391 settlements, for an average cluster size of 9.5 individuals per settlement.

Random assignment

The 391 settlements were divided into 15 geographic regions corresponding approximately to districts. Within each of these geographic regions, we calculated a migration intentions and experience index for each settlement, which was the average of the number of households listed who say they are likely to

migrate internationally in the next five years, and of the proportion of households in the settlement who have at least one international migrant member. We then sorted settlements by this migration intentions and experience index to form quadruplets of settlements within each geographic region, forming 98 strata. We then randomly assigned one settlement to each treatment group within each quadruplet (strata). Random assignment was done privately by computer.

Baseline characteristics of the settlements and individuals

Baseline summary statistics for the village-level variables elicited from an elder are shown in Table 1A, socioeconomic characteristics of the young men interviewed at baseline are shown in Table 1B, and migration history and intentions of these young men are shown in Table 1C. This baseline data both serves to help describe the sample that will be subject to the experiment, as well as to show that the sample is generally well-balanced across treatment groups. The last column of each table provides an F-test of equality of means across treatment effects (after controlling for randomization strata and clustering standard errors at the settlement level). Only 4 out of the 36 tests are significant at the 10 percent level or higher, which is in line with what we would expect by chance. As noted in our methods section, we will use post-double selection lasso to boost power and control for any chance imbalances.

Table 1A shows these settlements are ones where migration is generally common. Village elders report 18 percent of households to have a migrant in Europe, 13 percent to have a migrant in Senegal, and 27 percent to have a migrant in Banjul. Despite the launch of the Gambia Youth Empowerment Project (YEP), only 2.7 percent of settlements report any vocational training opportunities, while 20 percent report having previously experienced some form of information campaign around migration. The average cost of a bus to Dakar is 887 Dalasi (approximately $18).

Table 1B shows that the average individual in our study is aged 23. They primarily work in agriculture, with only 28 percent doing any paid work last month, and only 6.5 percent having a main occupation that was non-agricultural paid work during the rainy season. Education levels are very low, with 49.5 percent having no schooling, and an average of only 3.4 grades completed. The main languages spoken at home are local languages: Fula (43%), Mandingo (31%), and Wolof/Serer (18%), with only 25 percent saying they speak English (the official language) well enough to use in a job in which they would interact with customers, and only 1.4 percent speaking French well enough for this purpose. These characteristics highlight the importance of providing the information interventions in local languages. The low education level also suggests the youth may have difficulty with expressing some answers as percentages. For example, only 25 percent of the sample could correctly state the percent chance that a baby born is a girl. This will introduce additional noise to the percent chance questions used in SH1.

Table 1C provides details on their migration history and intentions. Very few have previously migrated to Europe (0.3%) or tried migrating to Europe unsuccessfully (2.9%). But desire to migrate to Europe is much higher. 55.6 percent say they would ideally migrate to Europe if they had the opportunity, and 14.6 percent

say they would do so the backway. The majority have someone in their network who has attempted the backway: 87 percent say they know someone who made it to Europe the backway, but also 61 percent know someone who died attempting this route, and 42 percent know someone deported from Europe. They view migration to Europe as generating prestige and respect among occupations in their community, ranking it highest out of different occupations asked. However, there is stigma associated with failed migration to Europe, with youth ranking this as less prestigious than migrating to Senegal or Banjul, or to just being a farmer. This suggests the possibility for youth to be over-optimistic about the odds of succeeding with backway migration, if stigma means that failed migrants do not talk much about their experiences.

Power calculations

The baseline data also provide key information that we use to inform our power calculations. In particular, it helps inform our anticipated control group means and standard deviations, can be used to calculate the intra-cluster correlations of different variables, and helps provide some possible sense of the gains in power from using the post-double-selection lasso. Table 2 provides the resulting power calculations for key outcomes specified in our primary hypothesis, and we discuss each in turn. The discussions below are for the power comparing a given treatment to the control group. Since we are unsure if any of the treatments will be successful, we are most interested in comparisons of each treatment group to the control, and discuss our power for these comparisons. Of course, we are then powered to detect the same effect size difference between treatments, which could occur if one treatment is not effective and another is, or if one is substantially more effective than another.

Our power calculations are for intention-to-treat effects (as described below in our statistical methods), and we compare to ITTs from the literature. The power calculations are for our full sized sample. Given the size of our sample and clustered nature, attrition rates of 10% or less will not make much difference to these calculations. For example, 80 percent power to detect a 3.1 percentage point reduction in migration will fall to 74 percent power with 10 percent attrition.

The baseline data show a mean of 0.41 *steps taken towards moving to Europe*, with a standard deviation of 0.98 and an intra-cluster correlation (ICC) of 0.071. Using this ICC and *n=10* individuals per cluster, the design effect is: $D = \sqrt{1 + (n-1)ICC} = 1.28$. That is, clustering causes the standard errors to be 1.28 times what would be the case with individual-level randomization. Taking samples of 898 individuals in the control group and 965 in the information treatment, this gives a Minimal Detectable Effect (MDE) of a reduction of 0.16 steps out of 5, or 0.16 standard deviations.[12] The strata fixed effects explain 5 percent of the baseline variance across youth in steps taken. The comparison of standard errors using strata fixed effects and using post-double-selection lasso for our baseline knowledge questions shows standard errors are

[12] This is calculated in Stata using *sampsi 0.41 0.246, n1(898) n2(965) sd1(1.25)*, where the standard deviation of 0.98 is multiplied by the design effect of 1.28 to account for clustered random assignment.

approximately 96% of the size of those without this correction. While we anticipate this to be larger for follow-up, we conservatively assume the combination of strata fixed effects and using post-double-selection lasso will reduce standard errors to 96% of those without these controls. This will reduce the MDE to a 0.155 steps reduction. This is a small effect size, and suggests we will be well-powered to detect changes in this primary outcome. This effect size can be compared to the migration facilitation intervention of Beam et al. (2016), who increased migration search by 10 to 16 percentage points, which would be equivalent to an increase of 0.5 to 0.8 steps on a 5-item scale.

The baseline data provide less guidance in predicting what the control mean rate of *migrating to Europe* will be. We have that only 3.2 percent have previously migrated or attempted to migrate to Europe (and this is a stock, not annual flow measure). But 14.6 percent say they would ideally migrate to Europe and go the backway, and when asked the percent chance they will migrate to Europe in the next year, the pre-intervention mean is 42.2 percent. Faced with this wide variation, we instead use news reports that 12,000 Gambians arrived in Italy in 2016 (Camara and Hunt, 2018). Since Italy is the main destination, we assume that the majority of these migrants are males aged 18 to 33, with the difference offset by migration to other European countries. Then population pyramid data indicates there are 171,000 males aged 20 to 29, so that the control group migration rate is estimated to be approximately 0.07 (with corresponding standard deviation of 0.255). The ICC of having previously attempted to migrate to Europe is 0.018, so the design effect is 1.08. The MDE at 80 percent power is thus 0.032. That is, we can detect a 3.2 percentage point reduction in migration from the control mean of 7 percent.[13] This is small in absolute terms, but represents a 46 percent reduction in the rate of actually making it to Europe. Making the same assumptions as for the migration steps, the addition of strata fixed effects and post-double-selection lasso will reduce this MDE to 3.1 percentage points, or 0.12 control standard deviations. This MDE effect size is approximately half of the 6 to 7 percentage point changes in migration rates of Nepalese migrants found by Shrestha (2019a) when providing information about the risk of dying and wages abroad.

Migration to Senegal is more closely tied to location, given that some settlements directly border on Senegal. The ICC is higher for this outcome (at 0.12 for previous migration to Senegal), so the design effect from clustered randomization is higher. But it is also the case that the randomization strata fixed effects explain more of the variation in this outcome (the R^2 on strata dummies alone is 9%), so we assume that the combination of strata and lasso will reduce standard errors by multiplying them by 0.92. Since 22 percent have previously migrated to Senegal, we assume half of this will do so within a single year, for a control mean of 0.11. The MDE is then 6.5 percentage points, or 6 percentage points after controlling for stratification and the post-double-selection lasso. These are equivalent in size to the treatment effects in

[13] *sampsi 0.07 0.038, n1(898) n2(965) sd1(0.275) sd2(0.206)*. Note that because the outcome is binary and treatment is assumed to reduce the outcome value from a low control mean, the treatment standard deviation will also fall, which helps improve power.

Shrestha (2019a), and considerably smaller than the 22 percentage point treatment effect induced by Bryan et al. (2014) for internal migration in Bangladesh.

Data collection and processing

The key data sources are as follows:

1. *Baseline survey* (already conducted) of 3,702 individuals in these 391 settlements, which took place between April 19 and May 18, 2019. This baseline survey was conducted by 2M Corp/RTA using survey tablets. Surveys were conducted in the local languages of Mandingo, Fula, and Wolof/Serer. The baseline survey collected socioeconomic characteristics, labor supply, migration history and network, intentions to migrate, beliefs and expectations, knowledge questions, preference questions, and follow-up contact information. Tables 1A, B and C provide key summary statistics.
2. *Administrative data on take-up of the Senegal bus voucher and vocational training intervention:* we will collect data on the redemption of the Dakar voucher in Senegal, and on the take-up of the vocational training program. This will be used to summarize take-up rates in the final report, and as a cross-check on the accuracy of survey reporting of migration to Dakar and of participation in vocational training.
3. *Endline survey:* we have debated whether to have a phone/SMS midline survey to collect intermediate data on location, but believe the response rates will be too low to make the data useful for impact analysis, and that we are better to spend our budget on maximizing the response rate for an endline. We will employ a three-step approach to the endline survey, starting in March 2020. The first step will be to conduct phone calls and send SMS and Whatsapp messages to obtain the current location of individuals. This will both provide a first data point on migration for those contacted, as well as help plan the logistics for in-person surveying. The second step will be face-to-face surveys. These will take place in all home communities and in Banjul and Dakar. These surveys will collect the outcomes outlined in our primary and secondary hypotheses above. Phone surveys will be attempted with migrants to other countries. When individuals can not be interviewed in person after at least three attempts, proxy respondents such as a parent or sibling will be asked to provide migration details. We will attempt to get as much of this surveying done as possible before Ramadan (April 23-May 23), and may need to break surveying for several weeks during this time. The final step will be an extensive tracking approach (outlined in detail in our approach to attrition), that will attempt to more extensively track individuals who could not be interviewed in person during the second phase. We will continue this approach until funding runs out or until extensive tracking is no longer yielding additional interviews. As noted in our discussion on attrition, we may need to randomly select a subset of the attritors to more extensively track and then re-weight if our budget will not cover tracking attempts on the full sample.

   We will likely employ the same survey firm used for baseline, to maximize the trust in enumeration and the chance of relocating individuals. Surveys will be done on tablets with multiple consistency

checks, and geo-coded and time-stamped to verify where and when surveys are done. Random callbacks will be done to a subsample to check data quality.

We anticipate this endline data collection process taking 4 to 6 months in total, finishing by December 2020.

Variations from the intended sample size

Our initial plan called for 400 settlements, and we ended up with 391 due to some settlements being smaller than anticipated. Given our baseline sample of 391 settlements and 3,702 youth, variations in sample size will then only come from endline attrition. We discuss above and below our approaches to reducing this attrition. In terms of non-compliance with treatment, every individual in the three treatment groups received the information part of their intervention (and each person in the control group received the placebo video), since this was administered during baseline. In addition, each person in the Senegal migration alternative was offered the Senegal bus treatment at the time of baseline, and each person in the vocational training treatment was offered the opportunity for training at baseline. Take-up of these as an alternative to backway migration is then part of what we will be measuring. The main concern is then implementation risks in getting specific details of the bus treatment and vocational training options to people over time, which we discuss in the risks section.

Pilot data

The baseline data are summarized in Tables 1A, B, and C, and discussed in the power calculations above. We also discuss in section 3 below, after outlining our empirical strategy, how the baseline data can be used to provide estimates of the short-term (immediate) impacts on migration knowledge, beliefs and intentions.

The last important piece of data from our baseline is that, after explaining the interventions, we asked respondents in the Senegal migration alternative if they are willing to take up the offer of a free bus ride. We find 589 of the 981 individuals in this treatment group reply yes (60.0%). This indicates strong potential interest in this alternative treatment. We likewise asked those in the vocational training treatment if they are interested in taking up the vocational training program, with 731 out of 963 saying yes (75.9%). This suggests that our vocational training option is also, in principle, interesting to study subjects.

Risks and Risk Mitigation

One of the observations of the JDE editors after a year of registered reports was a hope that the process would incentivize researchers to undertake projects that are risky in terms of methods, topics and context, but that to date they had not seen much of this.[14] We believe this study addresses an important policy and

[14] See http://blogs.worldbank.org/impactevaluations/pre-results-review-journal-development-economics-lessons-learned-so-far

development question, but involves several important risks. The most important risks, and our risk mitigation strategies are as follows:

1. Context risk: our sample settlements are remote, with poor transport infrastructure and weak connectivity. Only 37% of respondents say that they have cellphone coverage most of the time or always in their communities. This makes it difficult to stay in touch with field teams, and to remotely reach the individuals in the study. We will mitigate this by relying more on in-person visits to settlements and a face-to-face endline survey instead of multiple phone surveys.
2. Implementation risk: there are no regular buses to the settlements, and individuals have to travel over rough roads to major towns to catch buses. This complicates the logistics of our Senegal bus intervention. Vocational training will take place in the Julangel Skills Training center in the Upper River Region, requiring youth to navigate these transport logistics and make their way to training. Combined with the poor connectivity that makes it hard to regularly communicate with youth. These transportation issues will make it difficult for those interested in our alternatives to backway migration to participate. We are attempting to mitigate these issues through making transportation as easy as possible and trying a variety of media to communicate details to study subjects, but ultimately these risks are part of the policy reality of implementing alternative approaches in this context.
3. Tracking migrants risk: Tracking individuals who move locations is always challenging, and may be particularly challenging in this case when some individuals are migrating the backway. Failure to accurately capture this migration will generate bias in measurement of our main outcomes. We will mitigate this risk by means of extensive tracking and the use of proxy respondents where necessary, along with using bounding approaches.
4. Risk of null results: as noted in our literature survey, several experiences with information campaigns to reduce irregular migration have (while not being rigorously tested) been viewed as disappointing. Combined with the implementation risks above, there is a chance that none of the policies we test to try and reduce backway migration will succeed, despite our efforts to follow the suggestions of prior literature on how to make information campaigns more successful, and to implement the two alternative policies as well as possible Given the well-known challenges of publishing null results, we believe the registered report format is an important format for ensuring the results of this study will be shared, regardless of whether the policies are successful or not.

3. Empirical Analysis

Statistical methods and Statistical model

Measuring Impacts on Endline Outcomes

Our primary analysis uses outcomes from the follow-up survey and will estimate the following linear regression to estimate intention-to-treat effect. Let *Information*, *Senegal* and *Vocational Training* be dummy variables that take value one if the individual is assigned to the information intervention, Senegal migration alternative, and offer of vocational training respectively. Then for outcome *y* for individual *i* in settlement *s* we will estimate:

$$y_{i,s} = \alpha + \beta_1 Information_s + \beta_2 Senegal_s + \beta_3 Vocational\ Training_s + \sum_{j=1}^{98} \delta_j 1(s \epsilon strata_j) + \varepsilon_{i,s} \quad (1)$$

Where δ_j are randomization strata fixed effects (following Bruhn and McKenzie, 2009), and the standard errors $\varepsilon_{i,s}$ are clustered at the settlement level. Note that everyone in any of the three treatments will receive the information part of their intervention at the time of receipt of the baseline survey. For the information treatment effect, the ITT is therefore equal to the treatment effect on the treated. For the Senegal and Vocational Training treatments, the parameters β_2 and β_3 will measure the impact of receiving the information video treatment and then receiving the offer of assistance to travel to Senegal or the offer of vocational training respectively. We will not estimate the TOT for these two treatments, since those who do not take the bus to Senegal or take-up the vocational training will still have received the information part of their treatments, which could affect outcomes and thus preclude the use of assignment to treatment as an instrument for take-up of these parts of the treatment.

Note that the specification in equation (1) does not control for the baseline value of the outcome. While an Ancova specification typically can boost power, it is not possible in our setting since our key outcome variables are ones where all individuals have the same baseline value (i.e. they have not migrated). McKenzie (2019) discusses this situation, and we follow the recommendation there to boost power by ex-ante stratifying on geographic region and village-level migration experience and intentions. Then to further boost power, we will use the post-double-selection lasso approach of Belloni et al. (2014). This offers a transparent and disciplined way of choosing which variables to control for, and offers protection against chance imbalances in observables arising in the randomization, as well as against imbalances in observables arising from any selective attrition. We pre-specify here that we will implement this using the *pdslasso* command in Stata, taking as inputs the following 40 baseline controls: 7 village level variables, 11 socioeconomic variables, and 18 migration history and plan variables that were pre-registered for balance checks in our original pre-analysis plan (and shown in Table 1) and 4 additional baseline variables that we believe may affect willingness to migrate (whether or not they have a chronic health condition that limits travel, risk-seeking attitude (share of 1,000 Dalasi they would invest in a fair bet), patience level (on a scale of 0 to 10 for how much they are willing to undertake costly actions today for rewards in the future),

and the generalized self-efficacy measure of Chen et al, 2001). Estimation will use the default shrinkage parameter, and occur after partialling out the randomization strata fixed effects, and analysis will be clustered at the settlement level. This approach will potentially choose different control variables for each different outcome, choosing to control for the set of variables that either help strongly predict the outcome (thereby replacing the typical lagged dependent variable in Ancova) or that strongly predict treatment (which will occur if there is baseline imbalance arising from chance or attrition).

Our clustered random assignment allows for spillovers within settlements, but assumes no spillovers across settlements. The transport vouchers and vocational training vouchers are given to individuals and are non-transferrable, so we do not anticipate there being important spillovers from those components of the treatment. The main potential concern for spillovers would then be if the information about the risks of migration spillovers from any of the three treated groups to settlements in the control group. If this is the case, equation (1) would understate the impact of the information intervention. We do not believe such spillovers are likely to be very large given the geography and poor infrastructure, but will test for the presence of information spillovers by adding two additional controls to equation (1): the number of settlements within a five kilometer radius of a given settlement, and the proportion of these settlements which received an information treatment.

Measuring Short-term Impacts Using Baseline Data Only

In order to measure the immediate effects of receiving the information intervention and the offer of the Senegal migration alternative or vocational training option, we randomized at the individual level the placement in the baseline questionnaire of the pre-specified questions on knowledge, beliefs and intentions needed to test secondary hypothesis 1 (SH1). In particular, individuals were randomized into one of the following three groups:

Group A: received these questions *only before* being shown the video and receiving their intervention.

Group B: received these questions *only after* being shown the video and receiving the intervention.

Group C: received these questions *both before and after* being shown the video and receiving the intervention.

Our pre-analysis plan registered with the AEA registry then pre-specified that we could use both an *across-subject* and a *within-subject* design to estimate the short-term(immediate) effects of our interventions on individuals' knowledge, beliefs, and intentions.

The *across-subject* design uses groups A and B in all villages. Let *Group B* be a dummy variable that takes value 0 if individual *i* in village *s* is assigned to group *A*, and value 1 if they are assigned to group B. Then we estimate:

$$Y_{i,s} = a + \beta_1 Information_s + \gamma_1 GROUPB_{i,s} + \mu_1 Information_s * GROUPB_{i,s}$$
$$+\beta_2 Senegal_s + \mu_2 Senegal_s * GROUPB_{i,s} + \beta_3 Vocational_s + \mu_3 Vocational_s * GROUPB_{i,s}$$

$$+\sum_{j=1}^{98}\delta_j 1(s\epsilon strata_j)+\varepsilon_{i,s} \qquad (2)$$

Here β_1, β_2, and β_3 give the difference in outcome for individuals in Group A in the treated villages versus the control village. Since these outcomes are asked pre-intervention, these coefficients should be zero in expectation. γ_1 then gives the difference in this outcome for individuals in Group B compared to Group A in the control villages. It jointly captures any effect of the placebo video and of receiving a question after a video rather than before. Our key coefficients of interest are then μ_1, μ_2 and μ_3, which capture the difference-in-difference effect of being asked after the intervention compared to before the intervention in treatment villages versus control villages. The standard errors will be clustered at the village level, since although Group is assigned at the individual level, treatment is assigned at the village level.

In practice, the knowledge questions were not asked of *Group A*, and only asked post-intervention. A simpler across-subject design for the knowledge question then uses Groups B and C (who both received the knowledge questions only post-intervention), and estimates equation (1). This then captures the impact of receiving the treatments relative to the placebo video.

The *within subject* design only uses Group C villages. Let $\Delta Y_{i,j}$ denote the post-intervention minus pre-intervention change in the given outcome for individual *i* in village *s*. Then we use Group C to run:

$$\Delta Y_{i,s} = a + \beta_1 Information_s + \beta_2 Senegal_s + \beta_3 Vocational_s + \sum_{j=1}^{98}\delta_j 1(s\epsilon strata_j) + \varepsilon_{i,s} \qquad (3)$$

Where the standard errors are again clustered at the village level. If merely asking the question twice in quick succession changes responses, this will get captured in the control villages by a. The coefficients of interest in this regression are β_1, β_2, and β_3, which give the impact of each treatment on the difference in outcomes before and after the individual intervention in Group C villages.

The advantage of the within-subject design is that it potentially improves power by controlling for individual-specific levels of the outcome pre-intervention. However, the disadvantage is that there could be an anchoring effect, since individuals are asked the questions only about one hour apart. They may therefore anchor their post-intervention responses on their pre-intervention responses and not change them as much. The across-subject design is not subject to this concern, but may have larger variance.

Note that in both cases we are estimating the intent-to-treat effect of receiving the video part of the intervention and the offer of transport to Senegal in Treatment 2, or offer of training in Treatment 3. Since this is delivered along with the baseline survey, we expect compliance to be nearly 100 percent, and so the ITT will approximate the TOT for this part of the treatment.

Table 3 provides these immediate (short-term) effects using the baseline data, testing SH1 using our pre-specified estimation. We see that the interventions did succeed in improving knowledge. Column 1 shows that all three treatments significantly improved knowledge about migrating to Europe the backway. The control standard deviation is 0.96, so the coefficients represent 0.1 to 0.15 s.d. improvements in knowledge. We view this as a lower bound on knowledge gains, since, as noted above, a mistake by the survey firm meant that our last update to these questions was not implemented, and so some of the questions covered topics not included in the information intervention (e.g. how many countries they would pass through, or the fact that backway migration does not need a passport). Appendix Table C.1. shows impacts on the individual questions, showing largest and significant impacts on two questions that do cover video content: knowing how expensive the backway is, and knowing that some backway migrants are forced to work for others without pay. Column 7 shows that knowledge of migration to Senegal improved from the Senegal alternative intervention, and surprisingly, also from the vocational training intervention. Appendix Table C.2. examines impacts on the individual components of this knowledge measure, and finds the improvement from the Senegal intervention shows up most strongly in terms of individuals knowing they do not need a passport to travel to Senegal, and that they can legally work in most jobs in Senegal without having to apply for a work permit. As with the Europe backway knowledge, these questions are less tailored to the video content than was intended, and so are considered a lower bound on knowledge acquisition.

In contrast, in columns 2 and 3, we cannot reject the hypothesis that none of the treatments had significant impacts on beliefs about the various risks of backway migration. One possible reason for this is the difficulty many respondents had expressing answers as a number out of 100. Figure C.1. plots histograms of the different responses, and shows a large modal spike at 50. Fischoff and Bruine de Bruin (1999) note that excess distributional mass at 50 percent often reflects individuals having no idea as to the answer to a question. Consistent with considerable noise in these responses, we find many responses about nested risks to not appear statistically consistent. For example, 27 percent of respondents say the risk of not making it at least as far as Libya or Morocco is greater than the risk of not making it all the way to Europe, and 23 percent say the risk of dying on the way to Europe is greater than the risk of not making it to Europe for any reason.

We attempted to make it easier for individuals with no schooling to answer percent chance questions on a 0 to 100 scale by using a dynamic slider, as suggested by Maffioli and Mohanan (2018). Figure C.2. shows much less clumping at 50 percent, but considerable heaping at 0% and 100%. Table C.3 suggests that there is some signal in these questions by correlating their responses with other likely predictors of migration. Nonetheless, we do not find any significant reduction in the expressed percent chance of migrating to Europe in the next year (the Senegal treatment has a marginally significant impact on increasing migration likelihoods in the across subject design, but no impact on the within subject design[15]).

[15] If we adjust for multiple testing on multiple outcomes in Table 3 by calculating sharpened q-values that hold constant the false discovery rate, then only outcomes significant at the 1% level have sharpened q-

In contrast, we do find that the Senegal migration treatment does increase the expressed likelihood that they will migrate to Senegal in the next year in both the across and within subject designs. Figure C.3. shows this largely comes from reducing mass at 0% and increasing mass at 100%, highlighting the heaping in responses to these questions.

Finally, because of potential concerns about eliciting these subjective expectations from this population, we also implemented an action-oriented measure of interest in migration to Europe. During the interview respondents were given a flyer, which said if they want to find out more about wages for Gambians in Europe, they should send an SMS message in the next 7 days. 11.4 percent of the control group took the action of sending this message. We find that the Senegal treatment significantly lowered this by 4 percentage points, suggesting less interest in considering Europe as a migration destination.

Taken together, we view these baseline results as suggesting that the information part of the interventions was able to generate new knowledge, and, for the Senegal migration alternative at least, change intentions to migrate. The results also highlight the difficulties in measuring intentions and beliefs using percentages in this population, and none of our primary outcomes will rely on questions that require these measures.

Procedures for dealing with attrition, missing values, and outliers

Item non-response using baseline data is almost zero, and any missing baseline data will be dummied out when being used for controls in the post-double-selection lasso. That is, we will create dummy variables for having missing baseline data, and then replace the missing value with 0, including both variables in the control variable set.

Attrition in endline variables is much more of a potential concern, and we will use several approaches to attempt to mitigate this problem and to examine the robustness of our results to this issue. The most serious concern is that of survey attrition, and, in particular, that we are unable to survey individuals who migrate. We will mitigate this concern using the following procedures.

1. Collecting detailed tracking information at baseline: our baseline survey collects multiple forms of contact information for each individual, including own cellphone number (83% provide), the cellphone number of two contacts (93% provide), an email address (but only 1.4% have one), Whatsapp contact information (48.4% provide), Facebook account (11.4% provide), and contact information for two people (siblings, friends, parents, or village elders) who would know how to find them and contact them even if they move (99.5% provide). In addition, we have GPS locations for their households, and since migration tends to be by individuals and not entire households, should find family members remaining even if they move. This will help us contact individuals even if they

values below 0.10. In particular, the p-value of 0.091 for the Senegal treatment effect across-design intent to migrate to Europe has a sharpened q-value of 0.189.

move, and also to obtain knowledgeable proxy reports of location in cases where we cannot re-interview individuals.

2. For the half the sample with Whatsapp information, we have asked them to share their location using Whatsapp if they move, and will provide incentives in the form of phone credit for doing so.
3. Our follow-up field procedures will employ multiple visits spread over several months in order to attempt to survey individuals and interview individuals who are temporarily unavailable. We will use the contacts provided, other individuals in the community, and contacts with a Gambian migrant association in Senegal to help locate individuals. If tracking all the sample becomes too expensive, we will randomly choose a subset of the attritors to carry out more expensive tracking methods for, and then reweight the sample accordingly to boost the effective tracking rate, as done for the Kenyan Life Panel Survey (Bouguen et al., 2019).

We will then test for non-random attrition by treatment status by running equation (1) with attrition as the outcome, and test for balance on baseline observables for the sample responding to endline based on the same baseline variables as in Table 1. To examine the robustness of our results to attrition we will employ several approaches. The first, as specified above, is to use the post-double-selection lasso to choose baseline controls. This will control for any predictable difference in treatment status due to attrition. Second, we will compare the outcomes for individuals that required more extensive tracking to those surveyed using our regular surveying approach and see whether those who require more effort are differentially more likely to have migrated. We will use this to inform bounding approaches for robustness. For example, we will assume a conservative upper bound for migration rates among attrited individuals is the migration rate in the extensively tracked group plus two times the difference in migration rates between regular surveyed individuals and extensively surveyed individuals. This will be done separately by treatment status. Thus if the extensively tracked individuals in the information treatment group have a migration rate of 12%, and regularly tracked individuals in the information treatment group have a migration rate of 7%, then we will assume an upper bound for the migration rate among attritors in the information treatment group is 12+10 = 22%. A lower bound for the migration rate among attritors is 0%, and so we will calculate Manski- and Lee-style bounds that randomly assign the upper or lower bound of attritors to be migrants. For example, suppose we have 100 attritors out of the 965 individuals in our information treatment group, and that the migration rate is 9% for the 865 individuals interviewed. A lower bound on the migration rate in the full sample of 865 is then formed by assuming all the attritors are non-migrants, so that the lower bound migration rate is 0.10*0 +0.9*0.09 = 0.081. The upper bound migration rate then assumes that 22% of these 100 attritors were migrants, so the upper bound migration rate will be 0.1*0.22+0.9*0.09 = 0.103. Since results of treatment regressions will vary according to which specific individuals are assigned these bounded values, we will take the average of 100 simulations for the upper bound, each time randomly choosing 22 percent (in this example) of the attritors to have migration outcome 1, and the remaining attritors to have migration outcome 0.

Based on the baseline survey, item non-response rates conditional on answering the survey are anticipated to be extremely low. An exception will be if we need to use short phone surveys or to help collect the primary outcomes from attritors. Then we will employ the same methods as used for survey non-response to test for non-random item non-response for other questions, and use the same bounding methods as above if there is differential item non-response.

Our main outcomes are all binary outcomes (migrate or not) or tightly bounded outcomes (number of steps towards migration taken, Cantril ladder). As such, large outliers are not an issue for these outcomes. The only exception is income from work. As specified above, we will handle the possibility of outliers in this variable by winsorizing at the 99th percentile and carrying out the inverse hyperbolic sine transformation.

Another source of missing data will come from individuals who have died. For those who have died, we will attempt to ask family members about whether they were trying to migrate or not, and use these proxy responses to code our primary outcomes in domains 1 and 2. For the well-being domain, any individual who is dead will be coded as having 0 on the Cantril ladder, 4 for experiences of violence or threats to life, and 0 in terms of income.

In addition to item non-response, a potential concern is biased reporting. In particular, the concern is whether respondents will tell the truth about actual or attempted migration via the backway. Our sense from existing literature and field work is that there is little concern in this context about identifying actual migration to Europe, or a desire to migrate to Europe. We see this in our baseline data, with many respondents indicating a desire to migrate to Europe, and reporting having family or friends in Europe. As an additional test, we followed McKenzie and Siegel (2013) in using list randomization to measure the presence of family in Europe. One group of respondents was randomly chosen to be asked how many of the following responses were true: (1) at least one member of my household plans to open a business in the next five years; (2) the economic situation of my household has improved considerably in the last five years; (3) Corruption in my country is a less serious problem than ten years ago; and (4) This household has at least one member who migrated to Europe irregularly or through the backway. A second group were randomly chosen to be asked how many of responses (1)-(3) were true. Comparing the mean number of responses in these two groups gives an estimate of the proportion of households with irregular migration experience of 0.21, with a 95% confidence interval of [0.12, 0.30]. This compares to 21.2 percent saying they have family or relatives in Europe when asked directly (Table 1C). This echoes the finding of McKenzie and Siegel that list randomization results in quite large confidence intervals, but in settings where irregular migration is common, does not lead to higher reported migration rates. Given this, we do not believe list randomization will yield narrow enough estimates of the migration rate to be useful as a follow-up measure, but that this evidence (and that presented in McKenzie and Siegel for other countries with high irregular migration rates) suggests that underreporting of actual migration is unlikely to be a large threat to measurement.

The place where this issue may come up is with failed attempts, as there may be some stigma in the community associated with attempting to go to Europe the backway and not making it. Our understanding is that this stigma is less of an issue when talking with outsiders than with those within the community, and that by ensuring confidentiality and asking the respondent questions without others around, we are likely to get honest reporting. We considered random response methods (e.g. Respondents privately toss a coin before answering each question and are instructed to answer "Yes" if the coin comes up heads. If the coin comes up tails, they are instructed to answer the sensitive question truthfully) and list randomization, but believe the literature suggests that these methods will yield noisy outcomes and can potentially distort responses by suggesting there is something to worry about in responding to these questions. The other method for eliciting sensitive information that we will pilot is ACASI (Audio computer-assisted self-interview): here the respondent listens to the questions through headphones, reads them on the screen, or both, and enters the response directly into the computer. This method avoids asking the respondent to give his or her answers to the interviewer, and has been used in measuring illegal drug use, sexual behavior, and violent behavior. This may be useful for collecting information on experiences with physical harm, imprisonment, etc. during backway migration, but we need to test whether it can be implemented in our context.

Multiple outcome and multiple hypothesis testing

We will use three different approaches to address different aspects of multiple hypothesis testing.

The first approach arises from multiple treatments. Young (2019) notes that many papers fail to take account of multiple testing arising from multiple treatments. Since we have three treatments, all of our outcome regressions will include an F-test that tests the null hypothesis that all three treatments are jointly zero.

The second and third approaches deal with issues arising from multiple outcomes. Our second approach to dealing with this issue is to i) pre-specify a limited number of primary outcomes, broken up into domains by hypothesis, as set out above; ii) aggregate variables into pre-specified indices that are averages of standardized z-scores. We do this particularly in the well-being domain, where we use an index of different measures of violence, theft, and threats to life; as well as an overall index for outcomes in this domain. Single-estimate p-values from this approach are then useful for understanding results in a pre-specified primary hypothesis domain, as well as for comparing results for this outcome to those for the same treatment and outcome in other studies. Finally, our last approach is to also provide sharpened q-values that hold constant the false discovery rates when testing multiple treatments against multiple outcomes.

Heterogeneous Effects

The main aim of our study is to reduce the risk and likelihood of irregular migration, and provide potential alternatives. In order for there to be a treatment impact on reducing backway migration, youth must be

considering migrating the backway in the first place. Our baseline data contains many potential variables that could predict how likely someone is to migrate the backway: the information sources they have, their expressed intentions to migrate, and their socioeconomic and village characteristics. We will employ the repeated split-sample version of the endogenous stratification approach of Abadie et al. (2018) to examine heterogeneity in treatment impacts by whether individuals are below or above the median predicted level of the primary hypothesis outcome. We will do this for each of the backway migration outcomes in primary hypothesis 1, using the following 22 baseline variables as inputs to model the likelihood of taking steps to migrate to Europe, or actually migrating:

- Region dummy (URR or not), age, owns a cellphone, has Whatsapp, speaks English well enough for work, speaks French well enough for work, highest grade of school completed, married, worked for pay in last month, asset index; made unsuccessful attempt to Europe, number of people they know who died going the backway, number of people they know who made it the backway, have family or relatives in Europe, knows someone deported from Europe, would ideally move to Senegal, would ideally move to Europe, number of steps taken towards moving out of the Gambia, prestige rank of youth working in Europe, has chronic health condition that limits travel, Share of 1000 Dalasi that would gamble on fair bet, Willingness to give up something today for future benefit, and generalized self-efficacy.

In contrast, it is less clear what direction to expect heterogeneity in for migration to Senegal and migration to Banjul. The treatments aim to make these more attractive options than previously. The treatments might have less effect for those already planning on migrating to these destinations. But it may also be hard to change the actions of those with no intention/desire to move to these places, and impacts may be greatest for those with some interest in migrating, but who will not definitely migrate. We will therefore use both a 2 group split and a 3 group split on predicted likelihood of migration to Senegal and to Banjul in the Abadie et al. (2018) approach.

Finally, we expect the interventions to have the largest impacts on well-being for those individuals who would otherwise have the worst overall well-being. We will therefore use the overall well-being index defined in PH3_4, and endogenous stratification based on above or below predicted well-being.

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Figure 1: Total flow of migrants as a percentage of origin population crossing the central Mediterranean route in 2017 by top 10 countries of origin.

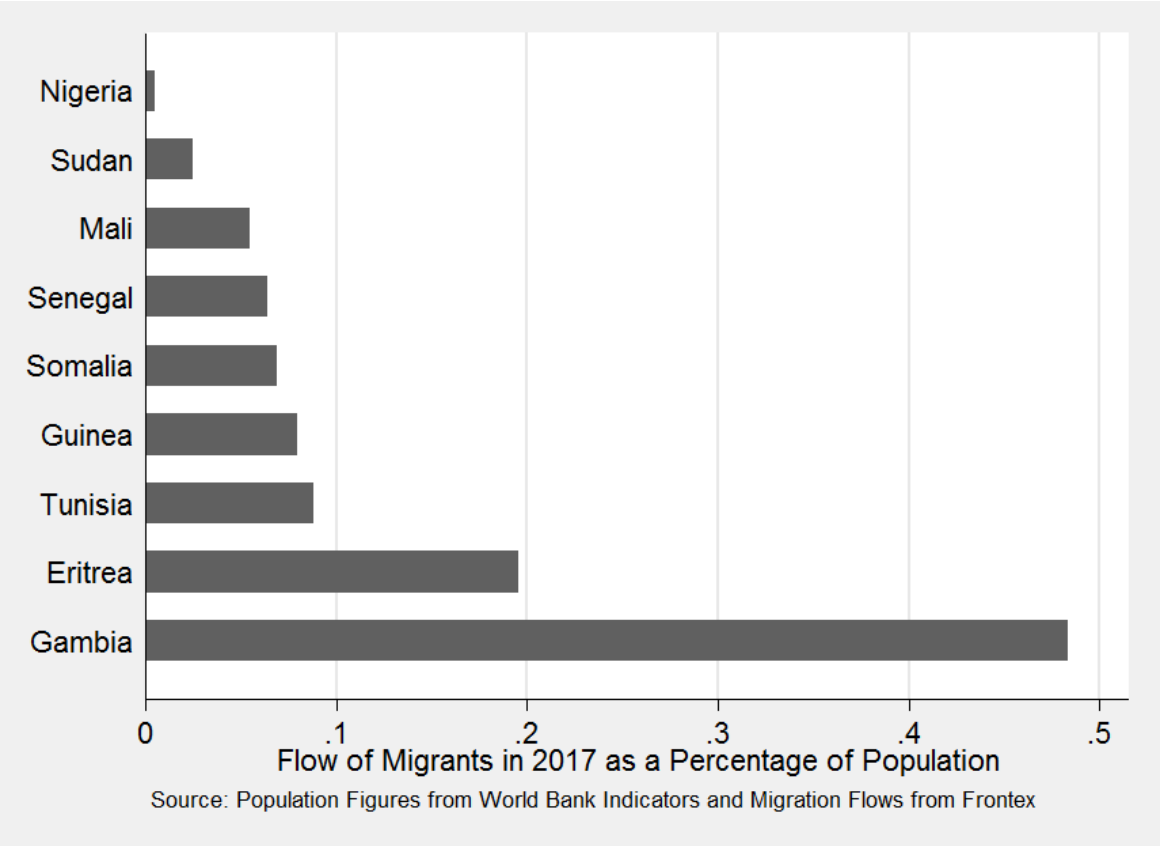
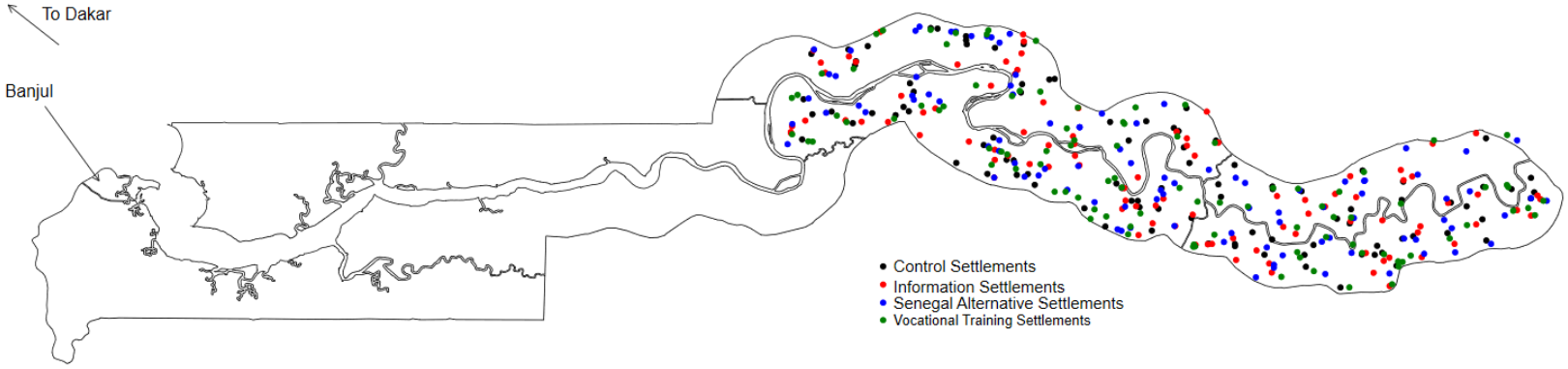


Figure 2: Map of the Gambia, showing selected settlements by treatment status and relation to Banjul and Dakar



Note: All settlements are within the Gambia. Atlantic Ocean is to the West, and the remainder of the country is surrounded above and below by Senegal.

Table 1A: Baseline Balance on Village Variables Elicited from Elders

	Control		Information		Senegal Alternative		Vocational Training		Pooled Sample		F-test for joint orthogonality
	N	Mean/SE	N	Mean/SE	N	Mean/SE	N	Mean/SE	N	Mean/SE	
Number of 15-30 year old males in the settlement	92	174.696	93	177.989	93	228.054	92	160.326	370	185.362	1.031
		[24.570]		[18.434]		[46.085]		[22.566]		[14.980]	
Fraction of households in this settlement with migrants in Europe	92	0.177	93	0.170	93	0.200	92	0.172	370	0.180	0.342
		[0.022]		[0.020]		[0.025]		[0.017]		[0.010]	
Fraction of households in this settlement have migrants in Senegal	92	0.108	93	0.123	93	0.126	92	0.142	370	0.125	0.549
		[0.021]		[0.020]		[0.022]		[0.025]		[0.011]	
Fraction of households in this settlement have migrants in Banjul	92	0.224	93	0.259	93	0.295	92	0.288	370	0.267	2.679**
		[0.028]		[0.031]		[0.034]		[0.034]		[0.016]	
Any vocational training program operating?	92	0.022	93	0.022	93	0.043	92	0.022	370	0.027	0.402
		[0.015]		[0.015]		[0.021]		[0.015]		[0.008]	
Any information campaign about migration previously run?	92	0.185	93	0.183	93	0.247	92	0.217	370	0.208	0.452
		[0.041]		[0.040]		[0.045]		[0.043]		[0.021]	
Cost of Bus ticket to Dakar (in Dalasi)	92	857.315	93	918.935	93	916.559	92	855.880	370	887.338	0.981
		[31.309]		[41.666]		[32.614]		[30.489]		[17.179]	

Notes: F-test for joint orthogonality conditions on randomization strata fixed effects.
***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 1B: Balance on Socioeconomic Characteristics from Baseline Survey

	Control Group Mean/SE	Information Group Mean/SE	Senegal Group Mean/SE	Vocational Training Group Mean/SE	Pooled Sample Mean/SE	F-test for joint orthogonality
Age	23.000	22.847	22.713	22.679	22.809	1.315
	[0.149]	[0.163]	[0.144]	[0.157]	[0.077]	
Own a cellphone	0.820	0.834	0.836	0.845	0.834	1.126
	[0.013]	[0.012]	[0.015]	[0.014]	[0.007]	
Has a Whatsapp account and shared it	0.459	0.496	0.480	0.500	0.484	1.552
	[0.027]	[0.023]	[0.024]	[0.024]	[0.012]	
Speaks English well enough for work	0.216	0.262	0.229	0.294	0.251	3.912***
	[0.020]	[0.026]	[0.023]	[0.025]	[0.012]	
Speaks French well enough for work	0.012	0.009	0.012	0.021	0.014	1.467
	[0.004]	[0.003]	[0.004]	[0.005]	[0.002]	
Highest Grade of School Completed	3.278	3.388	3.349	3.756	3.443	1.794
	[0.246]	[0.276]	[0.256]	[0.249]	[0.129]	
Married	0.301	0.294	0.287	0.269	0.288	1.004
	[0.022]	[0.022]	[0.019]	[0.020]	[0.010]	
Main occupation in rainy season non-agricultural paid work	0.063	0.054	0.064	0.078	0.065	1.871
	[0.008]	[0.007]	[0.012]	[0.010]	[0.005]	
Worked for pay in last month	0.293	0.270	0.277	0.269	0.277	0.168
	[0.020]	[0.019]	[0.020]	[0.021]	[0.010]	
Household member skipped meal in last month due to no fun	0.119	0.102	0.118	0.110	0.112	0.844
	[0.016]	[0.012]	[0.014]	[0.013]	[0.007]	
Asset index	-0.032	0.165	-0.141	-0.001	0.000	2.001
	[0.123]	[0.130]	[0.137]	[0.111]	[0.063]	

Notes: F-test for joint orthogonality conditions on randomization strata fixed effects, and standard errors are clustered at the settlement level.
***, **, and * indicate significance at the 1, 5, and 10 percent critical level.
Sample Sizes are 898 Control, 965 information treatment, 921 Senegal treatment, 918 vocational training treatment, for a total sample of 3702.

Table 1C: Balance on Migration History and Intentions from Baseline Survey

	Control Group Mean/SE	Information Group Mean/SE	Senegal Group Mean/SE	Vocational Training Group Mean/SE	Pooled Sample Mean/SE	F-test for joint orthogonality
Has migrated internally since age 12	0.392	0.389	0.356	0.379	0.379	1.807
	[0.019]	[0.022]	[0.020]	[0.020]	[0.010]	
Has migrated to Europe previously	0.001	0.006	0.002	0.003	0.003	1.831
	[0.001]	[0.002]	[0.002]	[0.002]	[0.001]	
Has migrated to Senegal previously	0.208	0.220	0.236	0.227	0.223	0.473
	[0.019]	[0.020]	[0.021]	[0.023]	[0.010]	
Made unsuccessful attempt to Europe	0.029	0.035	0.028	0.022	0.029	1.645
	[0.006]	[0.007]	[0.006]	[0.005]	[0.003]	
No. people they know who died going the backway	3.278	3.419	3.102	3.109	3.229	0.907
	[0.374]	[0.298]	[0.255]	[0.283]	[0.152]	
No. people they know who made it the backway	11.160	11.287	10.520	9.875	10.715	1.450
	[1.184]	[0.965]	[1.158]	[0.929]	[0.529]	
Have family or relatives in Europe	0.225	0.201	0.186	0.237	0.212	0.521
	[0.032]	[0.029]	[0.027]	[0.035]	[0.015]	
Knows someone deported from Europe	0.399	0.430	0.441	0.407	0.420	0.436
	[0.029]	[0.025]	[0.022]	[0.027]	[0.013]	
Received remittances from outside Gambia	0.290	0.297	0.290	0.279	0.289	0.603
	[0.027]	[0.027]	[0.025]	[0.026]	[0.013]	
Would ideally move internally	0.824	0.803	0.826	0.830	0.821	0.911
	[0.014]	[0.013]	[0.014]	[0.017]	[0.007]	
Would ideally move to Senegal	0.059	0.066	0.071	0.068	0.066	0.624
	[0.009]	[0.009]	[0.010]	[0.010]	[0.005]	
Would ideally move to Europe	0.556	0.549	0.572	0.547	0.556	0.782
	[0.020]	[0.025]	[0.020]	[0.022]	[0.011]	
Number of steps taken towards moving out of Gambia	0.383	0.454	0.395	0.392	0.407	0.674
	[0.046]	[0.044]	[0.038]	[0.038]	[0.021]	
Would ideally migrate to Europe and would go backway	0.125	0.156	0.162	0.142	0.146	2.196*
	[0.014]	[0.017]	[0.014]	[0.015]	[0.008]	
Prestige rank of youth working in Europe	1.952	1.942	1.932	1.832	1.915	1.066
	[0.070]	[0.080]	[0.068]	[0.070]	[0.036]	
Prestige rank of failed migration	6.540	6.659	6.645	6.720	6.642	3.396**
	[0.052]	[0.046]	[0.056]	[0.040]	[0.025]	
Prestige rank of youth working in Senegal	4.404	4.327	4.418	4.319	4.367	0.953
	[0.065]	[0.059]	[0.053]	[0.056]	[0.029]	
Having heard of Youth Against Irregular Migration	0.276	0.285	0.294	0.289	0.286	0.274
	[0.019]	[0.020]	[0.020]	[0.023]	[0.010]	

Notes: F-test for joint orthogonality conditions on randomization strata fixed effects, and standard errors are clustered at the settlement level.
***, **, and * indicate significance at the 1, 5, and 10 percent critical level.
Sample Sizes are 898 Control, 965 information treatment, 921 Senegal treatment, 918 vocational training treatment, for a total sample of 3702.

Table 2: Power Calculations

	Outcome		
	Steps taken to backway	Migrated to Europe	Migrated to Senegal
Inputs			
Assumed control mean	0.41	0.07	0.11
Assumed control s.d.	0.98	0.255	0.31
Intra-cluster correlation	0.071	0.018	0.12
Design effect with 10 per settlement	1.28	1.08	1.44
MDE at 80% power			
Comparison of means	0.16	0.032	0.065
After controlling for strata and PDS lasso	0.155	0.031	0.06
MDE in terms of control s.d.	0.16	0.12	0.19

Table 3: Short-Term Treatment Impact on Knowledge, Beliefs and Intentions

	Back-way Knowledge Questions	Beliefs about Riskiness of Backway Migration		Intent to Migrate to Europe		Sent SMS to get wage info	Senegal Knowledge Questions	Intent to Migrate to Senegal	
		Across Subject	Within Subject	Across Subject	Within Subject			Across Subject	Within Subject
Information Treatment	0.137***	0.014	0.020	-0.090	-0.054	-0.005	0.062	8.168**	-1.217
	(0.048)	(0.058)	(0.036)	(4.130)	(1.872)	(0.016)	(0.058)	(3.906)	(1.602)
Senegal Treatment	0.107**	0.029	0.004	6.756*	-0.015	-0.040***	0.132**	12.786***	3.095*
	(0.048)	(0.060)	(0.039)	(3.993)	(1.668)	(0.015)	(0.066)	(4.090)	(1.775)
Vocational Training Treatment	0.143***	0.121*	0.003	-3.063	-0.424	-0.003	0.167***	0.500	-0.868
	(0.052)	(0.067)	(0.032)	(4.115)	(1.770)	(0.016)	(0.064)	(3.866)	(1.502)
Sample Size	2509	2434	1268	2434	1268	3702	2509	2434	1268
Control Mean	2.715	-0.019	-0.021	42.164	-0.267	0.114	2.855	32.668	0.128
P-value treatments jointly zero	0.013	0.289	0.942	0.075	0.992	0.009	0.048	0.003	0.076

Notes: regressions control for randomization strata fixed effects, and cluster data at the village settlement level.

*, **, *** denote significance at the 10, 5, and 1 percent levels respectively.

Backway knowledge questions is the number of correct questions out of 5 about the process of migrating the backway; **Beliefs about Riskiness of Backway Migration** is an index of 7 standardized z-scores of the percent of migrants individuals believe experience different risks of backway migration; **Intent to Migrate to Europe** is the percent chance they will migrate to Europe in the next year; **Sent SMS to get wage info** is a dummy variable with value one if they sent an SMS to get wage information for Gambians in Europe, and 0 otherwise; **Senegal Knowledge Questions** are the number of correct responses out of 5 about the process of migrating to Senegal; **Intent to Migrate to Senegal** is the percent chance they will migrate to Senegal in the next year.

Across subject design shows difference-in-difference coefficients from comparing respondents asked question pre-intervention to those asked question post informational video and offer of Senegal or Vocational Training intervention; Within Subject design uses the pre-post change in outcome for those asked the question both before and after the intervention.

5. Appendices

A: More Details on the Interventions

A1. Europe Intervention Videos

A1.1 Returnees and Migrants Intervention Video

The information conveyed in the Europe video comes from personal experiences of "backway" returnees and migrants in Italy.[16] The video, which is about 20 minutes long, describes what motivated individuals to migrate, how they obtained information about the trip, how much they spend in financing the trip, what they experienced/saw along during the journey, and what is their general advice to prospective migrants.

Below we provide snapshots from the videos. In the first picture, a returnee explains how long it took him to cross the desert saying "It took us about two weeks in the desert, I was so tired. We ran out of water to drink and we spent days without water". In the second picture, they talked about what happened to people who died in the desert, highlighting the risk involved with the mode of transportation available. They explained that "we only rest for a while and the cars move at a high speed. Seated at the back of the car, there comes a time when you feel exhausted but got to move when the car starts. And "when someone dies in the car, what they do is stop the car dig, bury the person and journey continues. A lot of people died and it's not worth it".

Similarly, one of the returnees recalls spending one night in a Libyan prison saying that was the first time she was locked behind bars. Another talks about kidnapping and modern slavery documented elsewhere saying "I was sold to residents, the way fish is sold in the market, in fact we were sold like it's done during an auction. Seriously!". They recalled the fact that boats used during the trip are mostly inflatable and overloaded carrying more than 120 passengers. The notion that there is some form of information gaps is highlighted by one of the migrants in Italy saying "most people will be thinking about you will have in Europe, but this place is not easy, especially for Africans and foreigners". They also talk about how talking to their friends or watching TV influenced their decisions to migrate only to find out that it is harder than what they expected. In the last picture, they talk about the how about how the "backway" journey taught them that legal migration is more reliable and convenient.

[16] Recruiting migrants in Italy proved difficult, and those who agreed to participate insisted that their faces be blurred so that they could not be recognized by their family and friends.


It took us about two weeks at the desert, I was so tired. We ran out of water to drink,
we spent days without water

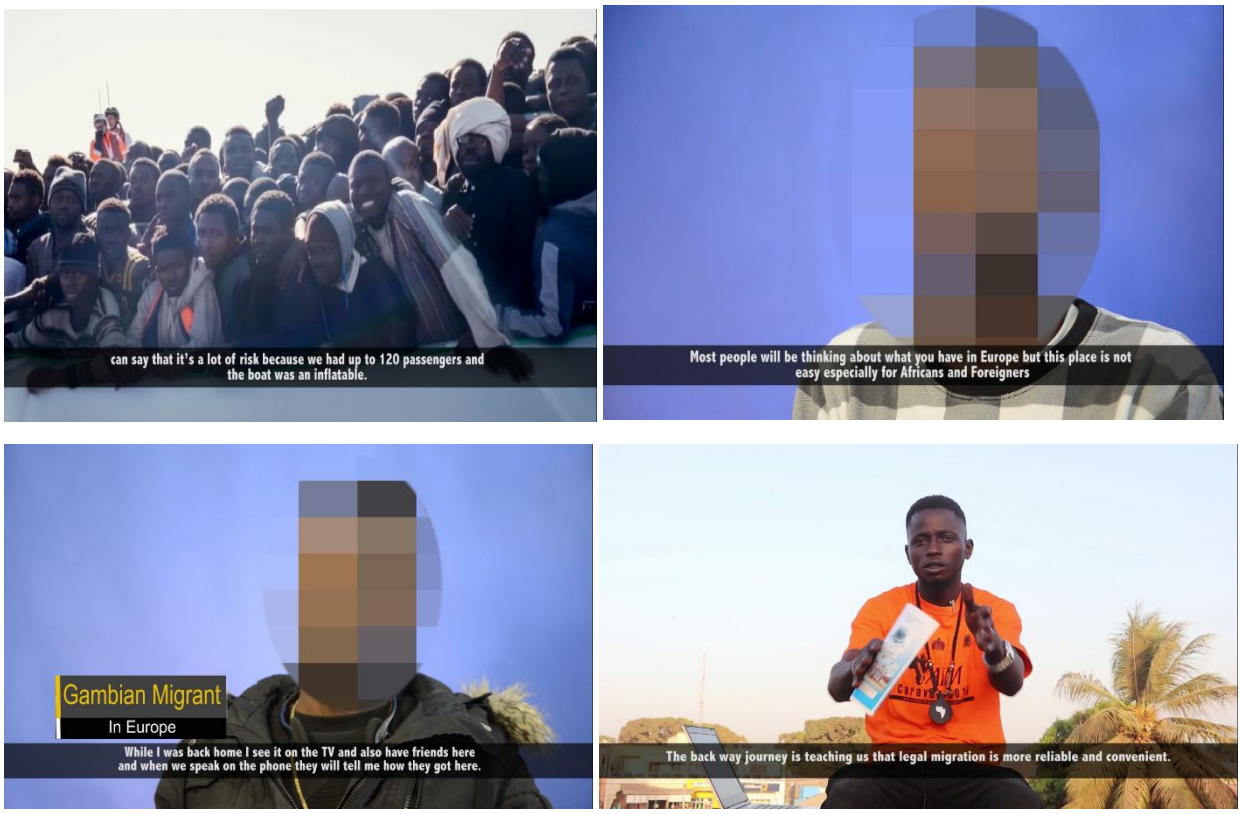

We only rest for a while and the cars move at a high speed. Seated at the back of the car,
there comes a time you feel exhausted but you got to move when the car starts


when someone dies in the car, what they do is stop the car dig and buried the person
and the journey continues. A lot of people have died and its not worth it.


Fatoumatta Cham
I spent a night in prison, that was my first time to be locked behind bars.


I was sold to residents, the way fish is sold in the market, in fact we were sold like its
done during an auction. Seriously!


Saihou Tunkara
Returnee from Libya
but if your family fails to pay the amount you are sold to another group or person.
Example, when one buys you for D50,000 you server him,



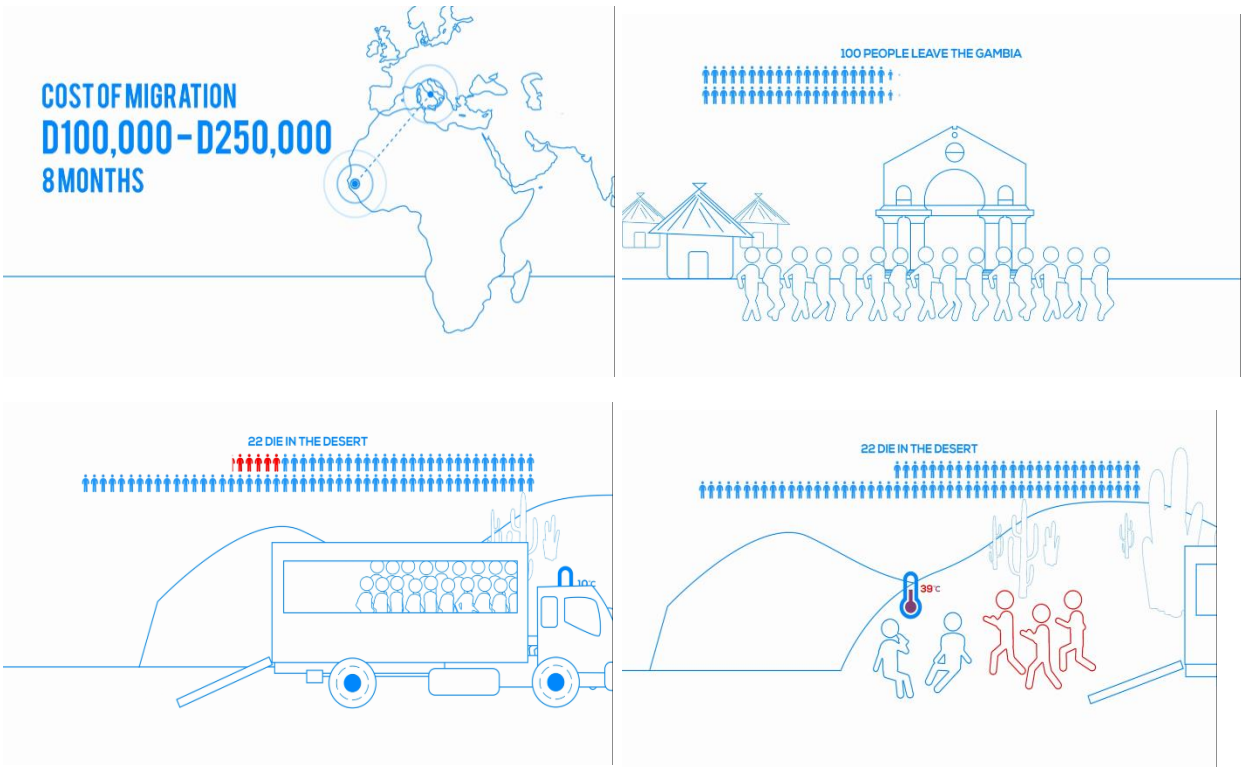
A1.2 Animation Video

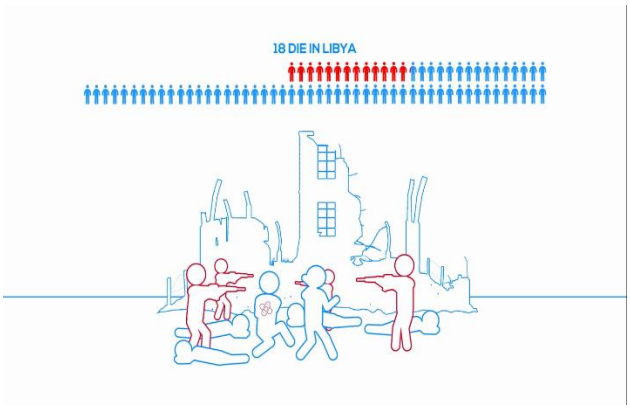
The animation video (3 minutes long) supplemented the testimonies of the migrants by focusing on the risks of dying and chances of obtaining legal status for irregular migrants. The video opens with the following introductory background about the migration journey:

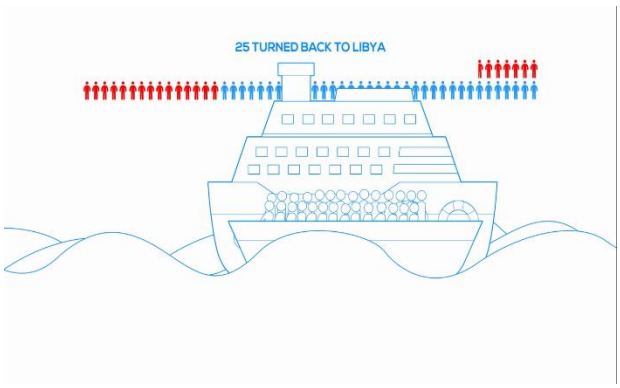
Migration from Gambia to Europe through the "Backway" can be risky, expensive and time consuming. Some die along the way, others experience torture, kidnapping, slavery and imprisonment. Those who can get to the sea, often see their boats returned back to Libya and sometimes drown in the sea. Those who get to Italy are most of the times deported back to Gambia because they have no legal residence papers. In the last two years, policies in Europe have been made tougher and more people are being returned to Libya and Gambia, even after they arrive in Italy. Migrating from Gambia to Italy can cost from 100,000 to 250,000 Gambian Dalasis. This journey lasts for about 8 months.

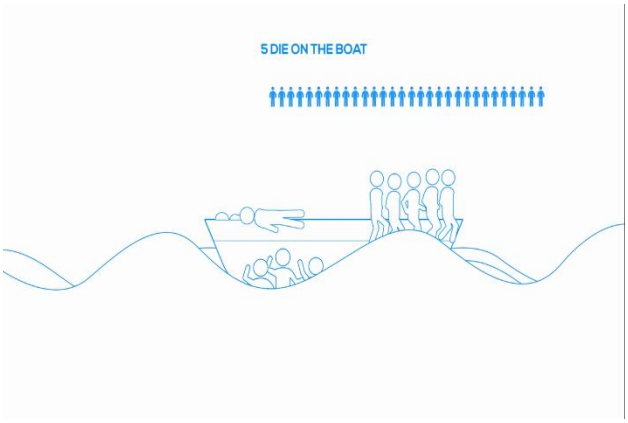
We have heard several Gambians who attempted to reach Europe through the Backway. We also heard from experts studying this journey. What they told us is described in the animation and testimonies that follow.

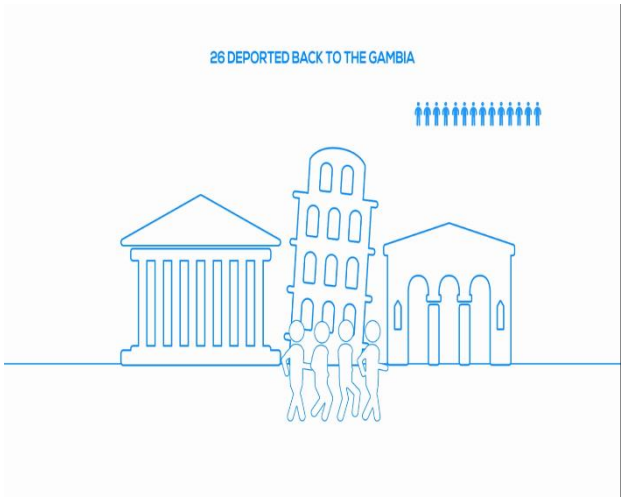
Using data from the North African Mixed Survey of migrants arriving in Italy through Libya, the video documents the chances or likelihood of Gambian migrants arriving in Italy and obtaining legal status. It details what happens in each stage of the journey to every 100 Gambians that leaves Gambia to Italy through the “backway”. The first picture portrays the journey costs and average duration. The second picture highlights for every 100 who passed through the desert, 22 die. Reasons for dying highlighted include overloaded vehicles that results into falling, dehydration, and violence. In the fifth picture, 18 people die in Libya due to conflict and lack of medical treatment. Of those that managed to reach the sea, 25 are returned to Libya by coast guard. Those that escape coast guard, about 5 percent die due to drowning, fuel exposure and asphyxiation under boat deck. Of those that reached Italy, 26 are deported to The Gambia and only 4 are granted asylum/residence status.

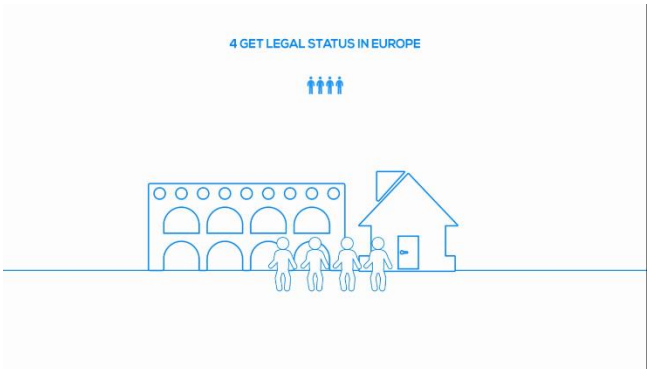



18 DIE IN LIBYA


25 TURNED BACK TO LIBYA


5 DIE ON THE BOAT


26 DEPORTED BACK TO THE GAMBIA

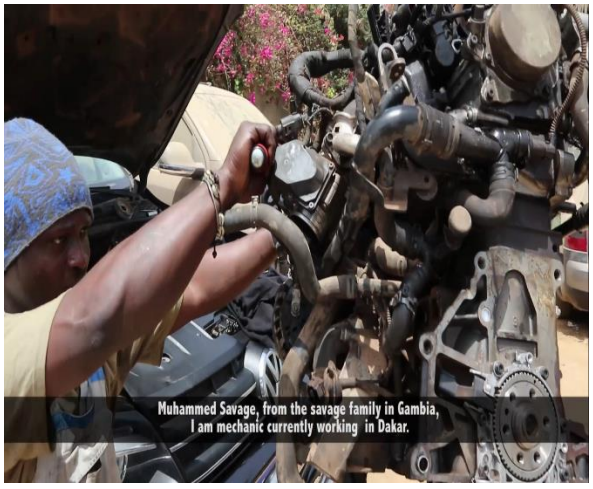

4 GET LEGAL STATUS IN EUROPE

A2. Senegal Intervention video

The Senegal video is a six-minute documentary about Gambian migrants living in Dakar, Senegal. They narrated their experiences and conveyed information about the type of jobs, and opportunities available to migrants in Dakar. These migrants were recruited from the census list provided by Gambians residing in Dakar. The list was obtained from the Gambian embassy in Senegal. The list contains the names of the migrants, their occupations, and their contacts. For each occupation, we use the listed number for calling and recruitment. Once we call the migrant, we explain briefly the aim of the project and arrange a visit to their workplace for the video shooting. A priori, we selected respondents based on their phone availability and their current location in Senegal (whether they were currently residing in Dakar).

Below are some snapshots taken from the video. The first picture portrays a Gambian migrant who works in the business sector, while the second shows a mechanic. This is followed by an elderly migrant talking about what opportunities are available to youths in Senegal saying “The youths can leave Gambia for Senegal and make it here, because right now we have young Gambians here as retailers, working with me and supporting their families”. Migration to Senegal as an alternative to irregular migration to Europe is reechoed by these migrants, one of them says “Europe is not the only solution to our problems; African countries are also here, like am here in Senegal” while another saying “Most Gambian migrants think that migration is only centered at going to Europe”.

Furthermore, they spoke about proximity of Senegal to Gambia, the earnings potentials of this type of migration. One says that “It’s not far from home and you can work and earn some money, it’s not a difficult country”. This is reiterated by another saying “It is not expensive travelling from Gambia to Senegal and it cost 6000CFA and it’s about 5 to 6 hours’ drive” and “you can receive up to 100,000 to 75,000 CFA it depends on your job”. Finally, they talked about equal opportunities of Gambians and Senegalese in Dakar.




The youth can leave the Gambia for Senegal and make it here, because right now we have
young Gambians here as retailers working with me and supporting their families.


Europe is not the only solution to our problems;
African countries are also here, like am here in Senegal.


Most Gambians think that migration is only centered at going to Europe,


It's not far from home and you can work and earn some money,
it's not a difficult country.


It's not expensive traveling from Gambia to Senegal, it cost 6000CFA
and it is about 5 to 6 hours drive.


you can receive up to 100,000CFA of 75,000CFA it depends on the job you do.


There are equal opportunities for both Gambians and Senegalese here in Dakar.
Honestly, I have been here for a while but it's positive.

A3 – Travel instruction leaflet and sample Dakar voucher

TRAVEL INSTRUCTIONS TO DAKAR

1. **We are buying back your transport voucher:** we pay you D1200.00 for your voucher. *This money is to pay for your travel costs to Dakar.*
2. You will receive a text message with a reference number to collect D1200.00 from the nearest ***JFin*** or ***Yonna Branch***
3. **Use public transport to travel to Dakar via Farafenni (Poste):**

   - ***From South Bank Road:*** travel to Soma and take a bus/van/"Gelegele" to Farafenni from Soma. Upon arriving at Farafenni Garage take a vehicle to Poste (Senegal) where you will take a vehicle to get to Dakar.

   - ***From North Bank Road*** **:** take a bus/van/"Gelegele" to Farafenni. Upon arriving at Farafenni Garage take a vehicle to Poste (Senegal) where you will take a vehicle to get to Dakar.

Note: DO NOT use the Vouchers at any point during this trip. Use the D1200.00 given to fund ALL travel expenses.

SPONSORED BY

TRAVEL INSTRUCTIONS TO DAKAR

3. Before starting the journey, you should call AMADOU NJIE who is a member of the ***Gambian Migrant Association in Dakar*** on

- ✓ **(00221)-7787-95394 (Whatsapp)**
- ✓ **(00220)-520-2380**

to make travel arrangements and agree on a meeting place after you arrive in Dakar.

4. When you meet AMADOU NJIE in Dakar, he will pay you (only you, not a friend with your voucher) **CFA 10,000 in cash.** To be paid the cash, you need to give him your **Dakar voucher**, and you need to **show your identification** and **sign to confirm** receipt of the cash.

NOTE: You cannot bring vouchers for other people. They will not be paid.

SPONSORED BY

A4 – Training registration instruction leaflet

TRAINING INSTRUCTIONS
Venue: GTTI (Julangel Branch)

1. Obtain a TRAINING VOUCHER from your interviewer
2. Send a REGISTRATION TEXT MESSAGE to 5122794. For Example;
   Name: Sheriff Sabally
   Issue Number: 0002213
   Interested Course: Plumbing and Gas Fitting
3. A receipt notification message will be sent upon receipt of the registration message.
4. You will be notified in September if your application was successful or not and the date on which the course will commence.

NOTE:

- Training Voucher ONLY covers TUITION FEES, that is all other expenses away from tuition should be handled by the beneficiary
- Registration is open until 31st August, 2019

SPONSORED BY

TRAINING INSTRUCTIONS
Venue: GTTI (Julangel Branch)

LIST OF COURSES TO BE OFFERED

1. Welding and Fabrication
2. Small Engines Maintenance and Repairs
3. Electrical Installation
4. Refrigeration and Air Conditioning
5. Carpentry and Joinery
6. Basic Certificate in Plumbing and Gas Fitting
7. Basic Certificate in Building Construction (Blockwork)
8. Basic Certificate in Plastering and Tiling

For more information please call: 5122794

SPONSORED BY

A5 – Follow-up questions on beliefs asked to respondents who are part of the Senegal and Training treatment groups

Respondents who are part of the Senegal and vocational training treatment groups were asked about their beliefs regarding the goal of the programs they were being offered, as well as about the entity paying for these programs and their motives for doing so. These questions were asked to respondents in the Dakar treatment group when they were being offered the financial incentives to travel to Dakar. The same questions were asked to the respondents in the vocational training when they were reached to receive details on the dates and logistical details of the training program.

1. What do you think is the main goal of the program?

   1= Help youth find jobs

   2 = Provide new skills to youth

   3 = Reduce backway migration to Europe

   4 = Distribute money

   5 = Educate youth on the danger of backway migration

6 = Promote Senegal as a place to work

7 = Understand the views of youth about job choices

8 = Other (specify) ……

2. Who do you think is paying for this program?

   1= Government

   2 = NGOs

   3 = International Organization

   4 = Other, specify ……

The answers of respondents in the Dakar treatment group are provided below in Figures A5.1. and A5.2.

Figure A5.1

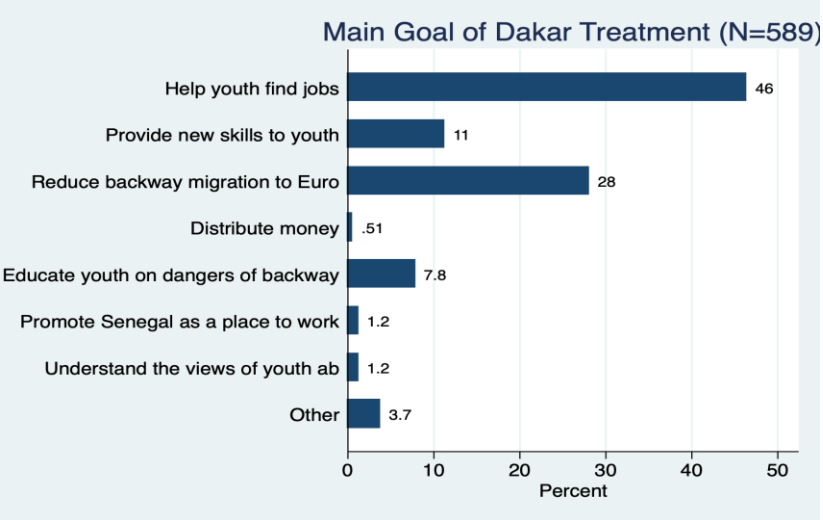
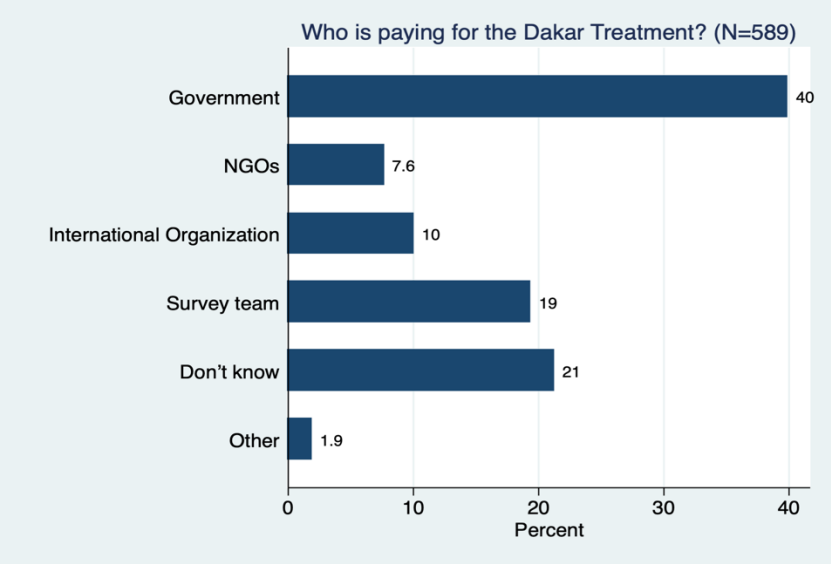


Figure A5.2



The analogous answers of respondents in the Training treatment group are provided below in Figures A5.3. and A5.4.

Figure A5.3

Figure A5.4

A6 – Follow-up questions to be asked to respondents on migration intentions

Questions for individuals who participated in training intervention

1- How valuable were the skills you acquired during this training? (0-5 scale)

0. Not at all useful
1. Not useful
2. Not very useful
3. Somewhat useful
4. Very useful
5. Extremely useful

2- What did you like most about this course?

Open answer:

3- What did you like least about this course?

Open answer:

4- Did this training course changed your intention to emigrate outside of The Gambia?

   0- No

   1- Yes

Questions to get asked of all respondents about migration intentions

5- How likely are you to move to a different location within The Gambia in the next five years? (0-5 scale)

   0- Will surely not move

   1- Likely not to move

   2- Maybe not move

   3- Maybe move

   4- Likely move

   5- Will surely move

6- What do you think you will do for a living five years from now if you stay in your home village?

   0- Keep farming

   1- Keep existing job

   2- Keep existing own business

   3- Find new job

   4- Create new own business

   5- Other - specify

7- How much money per month do you think you will earn in five years from now if you stay in your home village?

8- What do you think you will do for a living five years from now if you move to an urban area in The Gambia?

0- Keep farming

1- Keep existing job

2- Keep existing own business

3- Find new job

4- Create new own business

5- Other – specify

9- How much money per month do you think you will earn five years from now if you move to an urban area in The Gambia?

10- How likely are you to move to Senegal in the next 5 years? (0-5 scale)

0- Will surely not move

1- Likely not to move

2- Maybe not move

3- Maybe move

4- Likely move

5- Will surely move

11- What do you think you will do for a living five years from now if you move to Senegal?

6- Keep farming

7- Keep existing job

8- Keep existing own business

9- Find new job

10- Create new own business

11- Other – specify

12- How much money per month do you think you will earn five years from now if you move to Senegal?

13- How likely are you to move to Europe in the next five years? (0-5 scale)

0- Will surely not move

1- Likely not to move

2- Maybe not move

3- Maybe move

4- Likely move

5- Will surely move

14- Do you consider taking the backway to Europe?

0- Will surely not go

1- Likely not to go

2- Maybe not go

3- Maybe go

4- Likely go

5- Will surely go

15- What do you think you will do for a living five years from now if you move to Europe?

12- Keep farming

13- Keep existing job

14- Keep existing own business

15- Find new job

16- Create new own business

17- Other – specify

16- How much money per month do you think you will earn five years from now if you move to Europe?

B: More Details on Migration Attempts - Questions to be Asked

Asking about migration attempts

Can you please tell me about any moves and attempted moves to other countries since we last surveyed you in April/May 2019 (that is, just before Ramadan last year), starting with the first attempt.

M1.1. Intended Destination (this should be the ultimate destination you aimed to move to, not any country you were just passing through)

1. Italy 2. Spain 3. Germany 4 U.K. 5. Morocco 6. Libya 7. Senegal (=> M1.1a) 8. Guinea-Bissau 9. Other European country (specify) 10. Other country (specify)

999. Don't know

M1.1a If your intended destination is Senegal, did you intend to go to Dakar, another city, or to a rural area in Senegal?

1. Dakar
2. Another city
3. Rural area

M1.2 In what month and year did you leave your settlement/village to begin this attempt?

Month:

Year:

M1.3 What was your main reason for migrating?

1. Working/looking for work; 2. Medical reason; 3. Studying; 4. Visiting family/friends; 5. Accompanying spouse or other family member; 6. Other (specify)

M1.4. What procedure did you use or try to use when migrating?

1. Visa. 2. No visa required. 3. Backway 4. Other (specify)

M1.5. How much did you spend on each of these categories when making this move:

a. Visa fees:
b. Fees for transport:
c. Fees to smugglers:
d. Payments at roadblocks
e. Other (specify)

M1.6. Did you experience any of the following during this attempt? (1=Yes, 2=No)

a. Robbed of money

b. Physical harm (beating, torture, etc.)

c. Arrested/Imprisonment

d. Got stuck in an intermediate country

e. Other problem - specify

M1.7 Were you successful in reaching your intended destination?

1 = Yes -> M1.8 2 = No -> M1.7a

M1.7a What was the farthest point from your village you reached before turning back/returning?

1 = Somewhere else in Gambia

2 = Senegal (-> M1.7b) 3 = Mali 4 = Niger 5 = Desert 6 = Libya 7 = Morocco

8 = Italy 9 = Spain 10 = Other (specify)

M1.7b Did you reach Dakar at all?

1. Yes 2. No

M1.8 Are you still currently in this destination?

1. Yes -> M1.10 2. No -> M1.9

M1.9 How many months did you spend at this destination?

For individuals who attempted to migrate to Europe the backway

M1.10 On a scale from 1 to 7, where 1 is the least informed, and 7 is the most informed, how well informed do you think you were about the risks of migrating the backway before you begun your journey?

M1.11 How did the difficulty of the journey compare to what you were expecting?

1 = less difficult than I expected, 2 = just as difficult as I expected, 3 = more difficult than I expected

M1.12 Was there anything you wished you had known before making the backway attempt that you know now, that might have changed your decision to attempt the backway?

1 = Yes -> specify what_____

2 = No

M1.13 Do you remember watching the video we showed you of testimonies from returned migrants who had attempted the backway?

1 = Yes

2 = No -> M.2.

M.1.14 Did this video change in anyway your migration decision?

1 = It did not tell me anything I didn't already know

2 = It told me new information about the potential risks, but I decided the benefits were still worth the risks

3 = Other (specify)_____

C: More Details on Impacts on Knowledge and Beliefs

Tables C.1 and C.2 provide impacts on the individual components of the Europe backway knowledge and Senegal migration knowledge measures respectively. Figure C.1 shows the distribution of responses to the migration belief questions. Figures C.2 and C.3 show percent chances of migrating. Table C.3. examines the extent to which responses to the percent chance of migrating are associated with baseline characteristics.

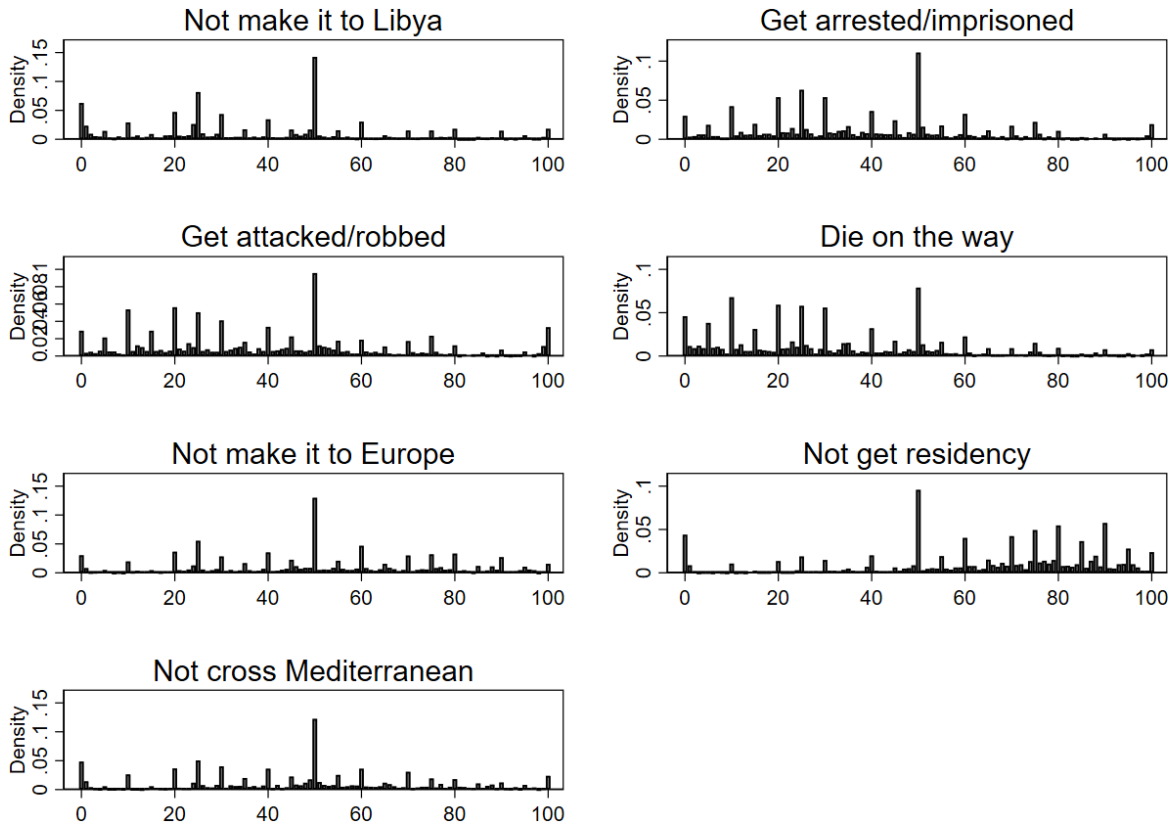
Table C.1: Question by Question Impacts on Europe Backway Knowledge

	Knows Backway Cost	Knows no. of countries transited	Knows forced work	Knows can be deported from Europe	Knows backway doesn't require passport
Information Treatment	0.059**	0.002	0.047***	0.015	0.014
	(0.025)	(0.018)	(0.016)	(0.017)	(0.027)
Senegal Treatment	0.061**	-0.002	0.039**	0.001	0.007
	(0.025)	(0.017)	(0.017)	(0.016)	(0.027)
Vocational Training Treatment	0.016	0.016	0.037**	0.028*	0.046
	(0.028)	(0.019)	(0.017)	(0.016)	(0.028)
Sample Size	2509	2509	2509	2509	2509
Control Mean	0.332	0.152	0.869	0.860	0.503
P-value treatments jointly zero	0.038	0.773	0.035	0.210	0.383

Table C.2: Question by Question Impacts on Senegal Knowledge

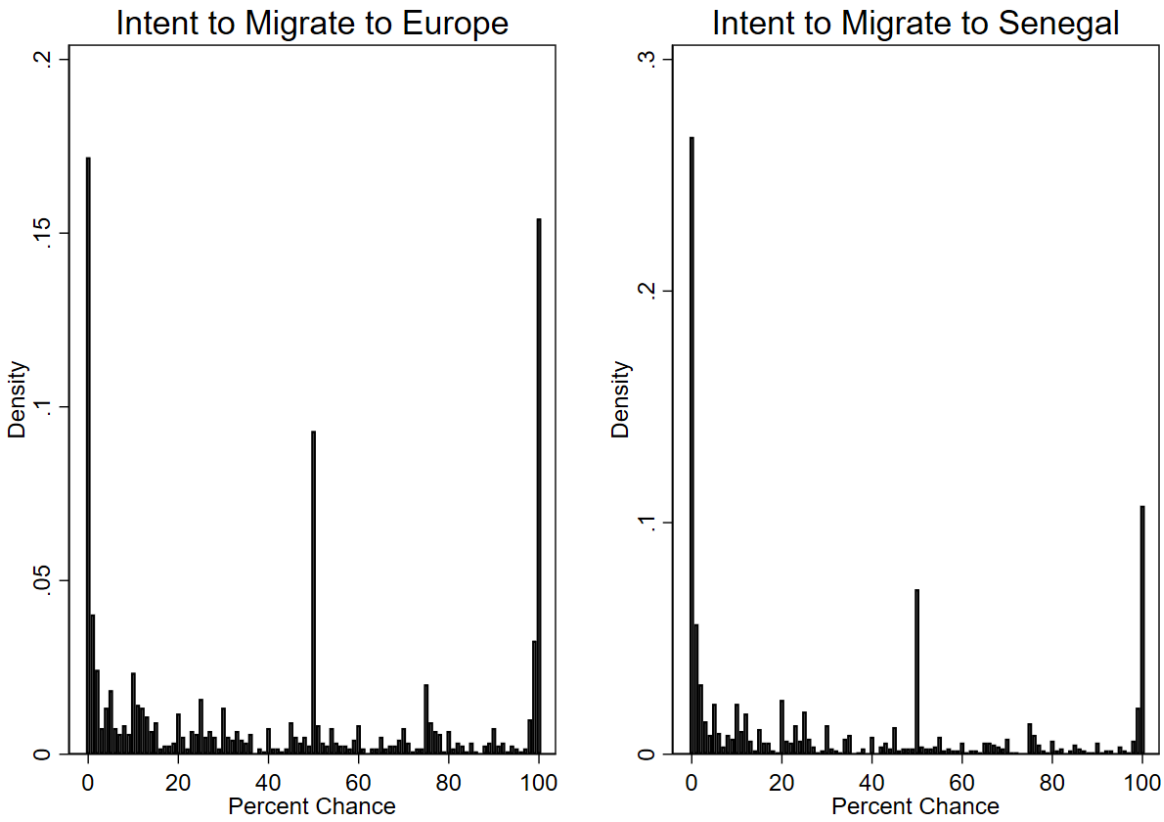
	Knows Monthly Wage	Knows don't need passport	Knows no limit on stay	Knows can legally work	Knows cost of bus ticket from village
Information Treatment	-0.012	0.031	0.017	0.036	-0.010
	(0.018)	(0.024)	(0.017)	(0.022)	(0.027)
Senegal Treatment	0.004	0.061**	0.025	0.052**	-0.010
	(0.018)	(0.026)	(0.018)	(0.025)	(0.028)
Vocational Training Treatment	0.016	0.079***	0.007	0.022	0.043
	(0.019)	(0.025)	(0.016)	(0.025)	(0.027)
Sample Size	2509	2509	2509	2509	2509
Control Mean	0.145	0.726	0.860	0.655	0.470
P-value	0.544	0.008	0.525	0.179	0.167

Figure C1: Histograms of Beliefs about the Riskiness of Backway Migration



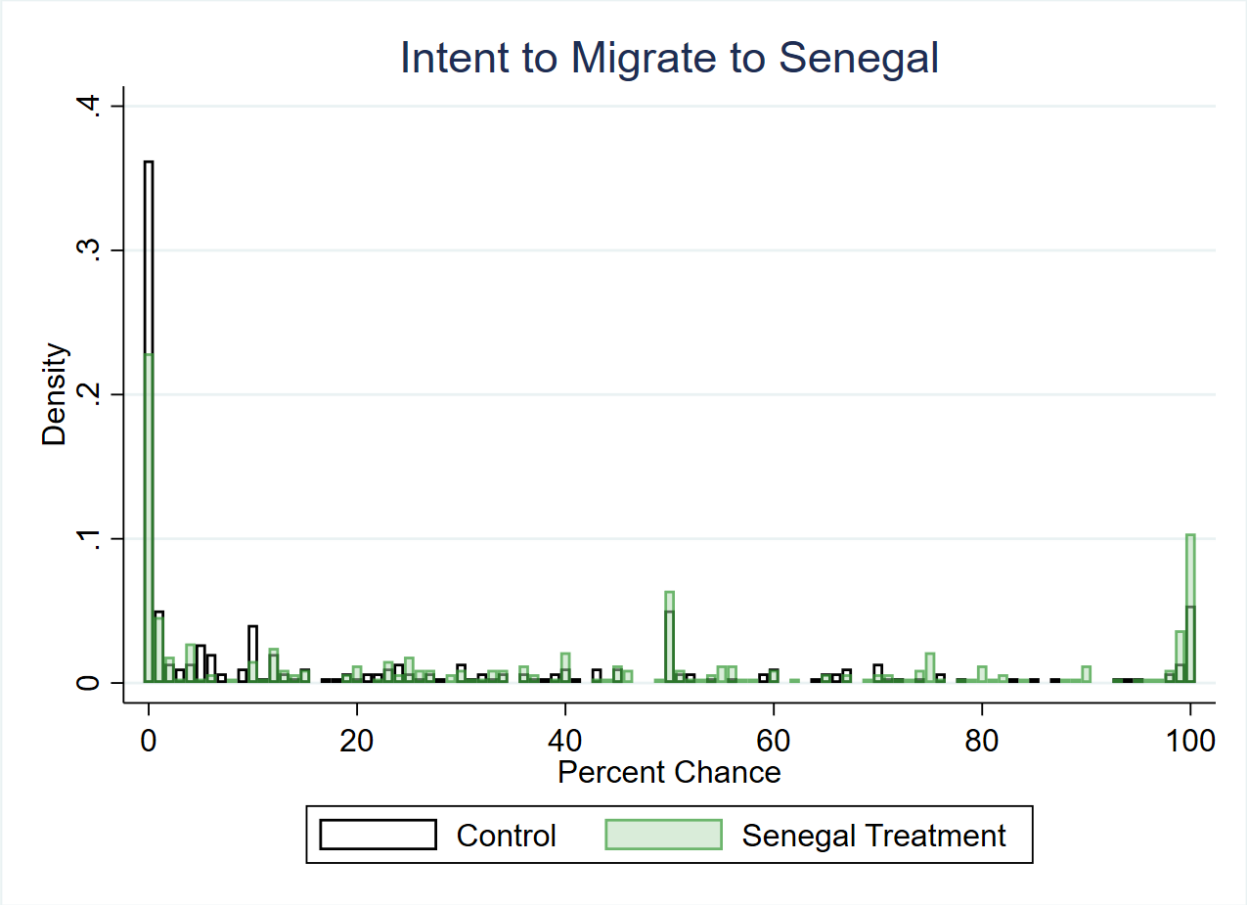
Notes: Each histogram is for the distribution of beliefs about the number of migrants out of 100 that our study sample believes will experience the given risk if migrating the backway.

Figure C2: Histograms of Percent Chance of Migrating in Next Year



Notes: percent chance of migrating in next year are for Group A, asked these questions before the interventions were given.

Figure C3: The Senegal Alternative Intervention Increases the Percent Chance of Migrating to Senegal



Notes: expectations of the percent chance of migrating to Senegal shown for Group B, which received these questions after the intervention only. Responses only shown for information and Senegal treatment groups.

Table C3: Associations between Migration Expectations and Baseline Covariates

	Percent chance will migrate to:	
	Europe	Senegal
Age	0.900**	0.688*
	(0.371)	(0.374)
Has chronic health condition that limits travel/work	8.285	1.037
	(5.777)	(5.599)
Share of 1000 Dalasi that would gamble on fair bet	0.077	-0.525
	(5.445)	(5.043)
Made unsuccessful attempt to Europe	-14.139**	-5.331
	(6.531)	(8.917)
Has migrated to Senegal previously	7.380*	9.418**
	(3.870)	(3.993)
Have family or relatives in Europe	6.220	-0.349
	(5.079)	(4.109)
Would ideally move to Europe	9.084***	4.231
	(3.286)	(3.303)
Would ideally move to Senegal	-1.616	10.820*
	(5.569)	(6.462)
Number of steps taken towards moving out of Gambia	11.388***	4.621***
	(1.429)	(1.525)
Sample Size	1193	1193
Sample Mean	42.837	32.626

Notes: Regression on Group A, which received questions before intervention. Regressions also control for settlement fixed effects, and cluster standard errors at the settlement level. *, **, *** denote significance at the 10, 5 and 1 percent levels

6. Administrative information *(required)*

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Institutional Review Board (ethics approval): If applicable, please include a statement confirming that all necessary ethics approvals are in place.

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Author Statement

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