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Evaluation of a multimedia marketing campaign to engage African American patients in glaucoma screening

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ABSTRACT

Our objective was to determine which messaging approaches from a marketing campaign were most effective in recruiting African American individuals to a glaucoma screening and research study. We conducted a multimedia marketing campaign in Philadelphia from 01/31/2018 to 06/30/2018. Messaging approaches included radio advertisements and interviews (conducted in partnership with a local radio station with a large African American listener base), print materials, event tables, and online postings. Participants received free glaucoma screenings and the opportunity to enroll in our glaucoma genetics study. These screenings allowed individuals with glaucoma to receive a full examination and treatment plan with a glaucoma specialist, as well as to contribute to future efforts to identify genetic variants underlying this disease. We compared inquiry, enrollment, and cost yield for each messaging approach. Our campaign resulted in 154 unique inquiries, with 98 patients receiving glaucoma screenings (64%) and 60 patients enrolling in our study (39%). Commercials on WURD radio yielded the highest number of inquiries (62%) and enrollments (62%), but at relatively high cost ($814/enrolled patient). The most inexpensive approach that yielded more than five enrollments was postcards ($429/enrolled patient). Our campaign suggests that high-frequency commercials and postcards distributed at targeted healthcare locations are particularly effective and affordable options for connecting with the African American community. Our findings can help to inform recruitment efforts for other understudied diseases in minority populations.

1. Introduction

The under-representation of African American individuals in medical research, as well as inequalities in access to and quality of care, contributes to persisting health disparities in the United States (National Healthcare, 2016; Heckler, 1985). This disparity is especially pronounced in genetic research. As of 2018, nearly 80% of participants in genome-wide association studies were of European descent, while only 2% were of African descent (Sirugo et al., 2019). Such dramatic differences not only limit understanding of disease biology, but also impede translation of findings into clinical action for under-represented groups (Popejoy and Fullerton, 2016). Scientists may develop genetic screening guidelines (Buxbaum et al., 2006), polygenic risk scores (Martin et al., 2017), drugs that selectively target mutations (Padoa et al., 1999) drug dosage recommendations (Johnson et al., 2017), or drug safety profiles (Luzzatto, 2010) based on results from homogenous study samples. The result is inaccurate medical assessments or lack of appropriate interventions for understudied populations.

One disease that exemplifies this disparity is glaucoma. Glaucoma is characterized by degeneration of the optic nerve and subsequent loss of vision. The most common form of the disease, primary open-angle glaucoma (POAG), affects 44 million individuals worldwide, with African Americans facing a disproportionate burden of disease (Tham et al., 2014; Quigley and Broman, 2006). This population is five to six

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times more likely to be affected by POAG than whites—and up to 15 times more likely to experience vision loss from the disease (Broman et al., 2008 Jan; Munoz et al., 2000).

Current interventions for POAG aim to lower eye pressure and slow disease progression before vision loss, with mixed success (Prum et al., 2016). These treatments cannot reverse vision loss from POAG, emphasizing the importance of early diagnosis and treatment for these patients (Weinreb et al., 2016). However, because POAG has no symptoms in early stages, more than 50% of affected patients are not aware of their diagnosis, delaying treatment (Quigley and Broman, 2006). Further, POAG is a highly familial disease, so loss of vision early in life can affect multiple family members (O'Brien et al., 2018). All this highlights the importance of screening for and identifying early disease, so that patients and their families can receive an earlier diagnosis that allows timely treatment. Early treatment can markedly improve outcomes and save vision, especially in overaffected, underserved communities such as the African American population.

For a subset of patients, existing treatments are insufficient to slow disease progression or prevent vision loss, even if patients are diagnosed in early stages (Weinreb et al., 2016). This suggests that POAG—a familial disease with a strong genetic component—has additional underlying disease mechanisms that could be elucidated by large-scale genetic studies. The major genetic studies of this disease to date have been conducted in cohorts of European or Asian descent (Danford et al., 2017). The glaucoma-associated variants identified in these studies do not replicate in the genetically diverse African American population (Liu et al., 2013; Hoffmann et al., 2014). These individuals continue to experience premature vision loss and subsequent adverse economic and health outcomes. Genetic studies in this population will allow for identification of variants and biological pathways that are unique to African American individuals, informing better-directed approaches to identify and treat this disease (Weinreb et al., 2016).

To address this unmet need, our team launched a large study of glaucoma genetics in African American individuals in Philadelphia, Pennsylvania. This five-year project, called the Primary Open-Angle African American Glaucoma Genetics (POAAGG) study, received National Eye Institute funding in 2014. Our team included glaucoma specialists, ocular geneticists, biostatisticians, a database manager, and clinical research coordinators. Study enrollment began prior to funding in 2010 and yields were initially high, with the majority of patients enrolling during regularly scheduled ophthalmology appointments at the University of Pennsylvania Health System. Over time, however, recruitment began to slow as the number of new eligible patients for the study decreased (Charlson et al., 2015). Thus, to increase enrollment and power to detect genetic variants, we launched a multimedia glaucoma awareness campaign throughout the city. At the time of this campaign, more than 10,000 glaucoma cases, glaucoma suspects, and controls had enrolled in our study. We subsequently conducted a genome-wide association study (GWAS) on the cases and controls.

This campaign had two main foci: 1) to provide free glaucoma screenings to African American participants, and 2) to enroll eligible glaucoma patients in our genetic study. We saw these efforts as complementary, with the first addressing the more immediate need to provide earlier diagnosis/treatment to patients without access to healthcare providers, and the second contributing to the larger goal of discovering genetic variants associated with this disease. We specifically chose to pursue these goals through a marketing campaign because there is a strong precedent for using this approach to strengthen community connections and to recruit underrepresented populations to research studies (Williams et al., 2012 Jan; Williams et al., 2011; UyBico et al., 2007; Fitzgibbon et al., 1998). We developed the majority of messaging approaches through a partnership with WURD Radio, which is the only Black-owned talk radio station in Pennsylvania—and one of only a few in the nation (WURD, 2016). This Philadelphia-based radio station has a wide listener base, which is detailed more in the Discussion. This paper evaluates the cost and effectiveness of multimedia campaign strategies to promote glaucoma screenings and increase enrollment of African American individuals in a genetics study in Philadelphia.

2. Methods

2.1. Study population

This campaign was conducted as part of the larger POAAGG study. The POAAGG cohort includes self-identified African American individuals (Black, African descent, or African Caribbean), aged 35 years or older, from the Philadelphia region. Eligible patients were recruited during regularly scheduled visits to ophthalmologists at the University of Pennsylvania and two external sites. These external sites included a private practice in West Philadelphia of a glaucoma specialist (Windell Murphy, MD), and the Ophthalmology Department at Temple University. Fellowship-trained glaucoma specialists classified subjects as cases, controls, or suspects based on detailed clinical criteria (Charlson et al., 2015). The study design, complete eligibility criteria, and phenotyping methods have been extensively described elsewhere (Charlson et al., 2015). The study protocol and consent statement were approved by the University of Pennsylvania institutional review board (IRB).

2.2. Messaging approaches

In January 2018, researchers from the POAAGG study launched a

Table 1
Messaging Approaches for the Marketing Campaign (01/31/2018–06/30/2018).

Messaging Approach	Frequency/Quantity	Description
WURD Radio		
Commercials	1440	Advertisements discussing the importance of glaucoma prevention and offering a free screening at the Scheie Eye Institute, with the opportunity to enroll in the POAAGG study.
Physician Interviews	4	African American glaucoma specialists interviewed by WURD Radio hosts about eye health, glaucoma prevention, and the POAAGG study (aired live).
Event Tables	2	African American outreach coordinator shared materials and information about glaucoma screenings and POAAGG study during WURD-sponsored events or tables at health fairs.
Patient Testimonials	28	Patients described personal experience with free glaucoma screening and enrollment in POAAGG study.
Show Sponsorship	37	Open and close billboard was provided before/after other WURD shows ("This show was brought to you by the POAAGG study….").
E-newsletter	22	Information about study included in weekly digital newsletter emailed to *WURD Radio* subscribers (Supplementary Fig. 1).
Other Methods (not delivered through WURD)		
Study Postcards	2173	Postcards distributed at local sites (Supplementary Fig. 2).
Outreach Flyers	2027	Flyers distributed at outreach screening sites prior to events (Supplementary Fig. 3).
Facebook Outreach	1x	Facebook event created for upcoming outreach event.
Study Website	N/A	Description of POAAGG study on University of Pennsylvania clinical studies website.
Thank You Cards	60	Letters mailed to patients post-appointments with phone number for interested family/friends.

Philadelphia-wide campaign involving multiple means of communication (Table 1, Supplementary Table 1).

2.3. Tracking messaging methods

Investigators used the TrialX iConnect recruitment tracking and analytics system to trace phone calls yielded from each messaging approach (iConnect Patient Recruitment Management System, Version 3.0, TrialX Inc New York, NY 10016). Each messaging approach was added to iConnect as a campaign and assigned a unique trackable phone number, which fed into a landline. All phone numbers had a local area code to ensure recognizability among patients. When a patient placed a call to the study, the call was forwarded to our landline and the unique trackable number from that specific messaging approach was recorded by the iConnect system.

This system allowed us to analyze the number of phone calls and duration of calls for each messaging approach. Each patient was only counted once, regardless of how many times he or she called. Missed calls, junk calls, and misdials were removed from consideration as unique inquiries.

2.4. Determining eligibility

Individuals who called the advertised phone line were asked a set of questions to determine whether they met the "pre-screening criteria" for an in-house evaluation. These criteria included: self-identification as African Americans (Black, African descent, or African Caribbean), aged 35 years or older, and self-report of a glaucoma diagnosis. Individuals who met pre-screening criteria were asked their phone number, home address, sex, date of birth, current place of glaucoma care, and details about past and current glaucoma medications and procedures. If available, electronic health records were used to further confirm likelihood of eligibility. Callers who met initial pre-screening eligibility criteria were offered appointments that included free examinations with glaucoma specialists and the opportunity to enroll in the study.

Individuals who did not meet pre-screening criteria for an in-house appointment, yet still expressed interest in a free glaucoma screening, were scheduled for an appointment at an upcoming outreach event with the same team of specialists.

Individuals with general inquiries (often on behalf of friends or family members) or interest in scheduling a regular ophthalmology appointment were transferred to the regular ophthalmology scheduling line and/or offered information about upcoming outreach events.

2.5. In-house screenings

In-house screenings were conducted in a private suite fully equipped with glaucoma screening equipment. Patients who agreed to enroll in the POAAGG study completed the informed consent process and provided a saliva sample. Screenings included a comprehensive health history, ultrasound pachymetry (measures central corneal thickness), Goldmann applanation tonometry (measures intraocular pressure), stereo disc photography (provides images of the optic nerve), optical coherence tomography (takes cross-sectional images of retina), and visual acuity and visual field testing. Following this screening, each patient was seen by a glaucoma specialist, who performed a complete eye examination, confirmed eligibility for the study, determined status as case, control, or suspect (if applicable), and discussed the patient's diagnosis/treatment plan. In brief, cases were defined as having an open iridocorneal angle and characteristic optic nerve defects with corresponding visual field loss, while controls were patients seen in regularly scheduled ophthalmology appointments without a glaucoma diagnosis or confounding ocular conditions. Glaucoma suspects were defined as individuals with risk factors for POAG (e.g. elevated intraocular pressure, high cup-to-disc ratio), but without optic nerve damage or visual field defects.

The screening was free for all participants, regardless of enrollment status. All participants were compensated $10 for attending in-house screenings and provided with lunch, parking, and/or taxi vouchers as needed. If interested, participants were welcomed to switch their future care to the glaucoma specialist. Patients who were interested in follow-up care, but did not have current insurance coverage, were counseled by trained professional staff.

2.6. Outreach events

During the campaign, study investigators hosted two community screening events, which took place at a church and at a senior community center. A previously purchased mobile van was used to transport glaucoma screening equipment to each outreach site, as detailed in a previous publication (Salowe et al., 2017). During these outreach events, attendees received free exams with glaucoma specialists and the opportunity to enroll in the POAAGG study, if eligible. Attendees of these events were either: 1) scheduled appointments or 2) walk-ins. Patients with scheduled appointments included callers who did not meet pre-screening criteria for an in-house screening, but were still interested in a glaucoma screening. Walk-ins included patients who saw or heard advertisements for the event and showed up that day.

2.7. Post-Appointments

Following in-house screening appointments, each patient received a thank you letter with a phone number to share with family or friends. Two patient participants who consented to share information about their experiences were re-contacted and recorded testimonials with WURD Radio.

2.8. Data collection

A unique inquiry was defined as an individual who spoke directly with a staff member on the phone, at an event table, or at an outreach event. All data were recorded and analyzed in Excel.

2.9. Cost analysis

The total cost of each messaging approach was calculated. For the purposes of this study, we excluded baseline enrollment costs, which included saliva kits for DNA collection ($17.50/patient) and gifts cards ($10/patient, given at end of screening). The main costs considered were directly related to the campaign and can be divided into four main categories. 1) Marketing costs included expenses associated with the WURD partnership and postcard printing. 2) Personnel time included the salary of the phone call operator ($25/h), with average call time of 6 min; staff who created and distributed content ($25/h); staff who conducted in-house screenings ($15/h); and staff who conducted outreach events ($15/h). 3) Physician time included the salary of glaucoma specialists for time spent screening patients at in-house appointments and conducting WURD physician interviews ($125.21/h). This section does not include outreach events, as all time was volunteered. 4) Patient transportation costs included parking passes and cab vouchers ($14/patient). Equipment costs were not included in this analysis. The seven walk-in patients enrolled at outreach events were also excluded from this analysis.

3. Results

3.1. Screenings and enrollments

The campaign generated 154 unique inquiries, with a total of 98 patients (64%) receiving free screenings with glaucoma specialists and 60 patients (39%) enrolling in the POAAGG study (Fig. 1). The mean age of enrolled patients was 68.8 years, and the sex distribution was

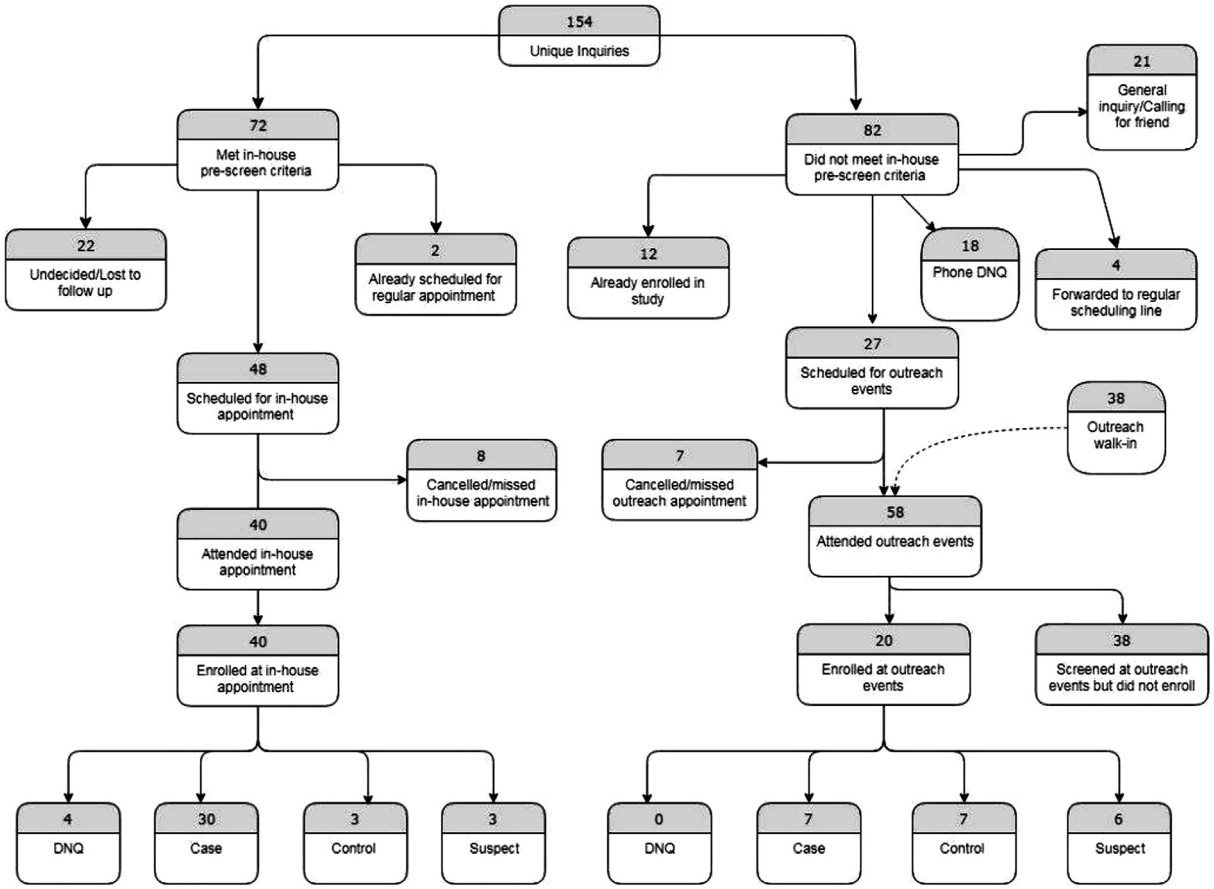

Fig. 1. Flowchart of unique inquiries in response to the campaign, through enrollment in the POAAGG study, from 02/01/2018 to 8/31/2018.

60% female and 40% male.

In-house screenings resulted in the screening and enrollment of 40 patients, including 30 cases, 3 controls, and 3 suspects. An additional 4 patients were found not to qualify for the study after completing the enrollment process.

Outreach events led to the screening of 58 patients and enrollment of 20 patients, including 7 cases, 7 controls, and 6 suspects. The 58 screened patients included 20 scheduled campaign patients and 38 unscheduled patients (referred to as "walk-ins").

3.2. Messaging outcomes

Of the 154 unique inquiries, 118 (77%) arose from WURD Radio approaches and 36 (23%) arose from other methods (Fig. 2). WURD commercial spots (n = 1140) yielded the highest number of inquiries (96) and enrollments (37) of the messaging approaches. Other top contributors to patient inquiries included study postcards (n = 2173; 16 inquires), WURD physician interviews (n = 4; 12 inquiries), and WURD event tables (n = 2; 8 inquiries). Interestingly, of the 16 inquiries from postcards, 8 arose from outreach event sites and 6 from Penn Medicine sites. After commercial spots, patient enrollments arose primarily from study postcards (8), outreach walk-ins (7), and event tables (4).

Messaging approaches that did not yield any inquiries, as well as walk-in patients (not tracked in iConnect), were not included in Fig. 2. Investigators unintentionally used the same phone number for the WURD e-newsletter and show sponsorship. This number yielded two unique inquiries, which were excluded from Fig. 2 and were not included in further analyses.

3.3. Cost analysis

In whole, the campaign cost a total of $59,589, with the majority of expenses (85%) arising from marketing efforts ($50,885) (Table 2). For the 60 enrolled patients, messaging expenses ranged from $205 to 2220 per patient enrolled. The WURD physician interviews and event tables had the highest cost per enrolled patient ($2220/enrolled patient and $1214/enrolled patient, respectively). The WURD commercials had the highest total cost of the campaign at $30,112, but yielded the highest number of enrollments (37), bringing the total cost per enrolled patient to $814. More moderately priced methods included study postcards ($429/enrolled patient), study website ($294/enrolled patient), and outreach flyers ($205/enrolled patient). Finally, several methods yielded zero patient enrollments.

4. Discussion

The Philadelphia-wide campaign resulted in 154 unique inquiries, 98 screenings, and 60 enrollments in our glaucoma genetics study over a period of six months, including 37 individuals who qualified as glaucoma cases. We found that radio methods, particularly high-frequency commercials, were most successful in reaching our target population, both in terms of inquiries and enrollments. From a financial perspective, print methods were the most inexpensive, but reached a smaller number of individuals (Jou et al., 2014).

This campaign specifically recruited patients with glaucoma for screenings and enrollment in a genetic study. Glaucoma represents a pressing health need in African Americans. Like many other diseases, a critical barrier to progress is the lack of genetic studies in this population, which results in an incomplete understanding of the unique genetic architecture of the disease in African Americans patients

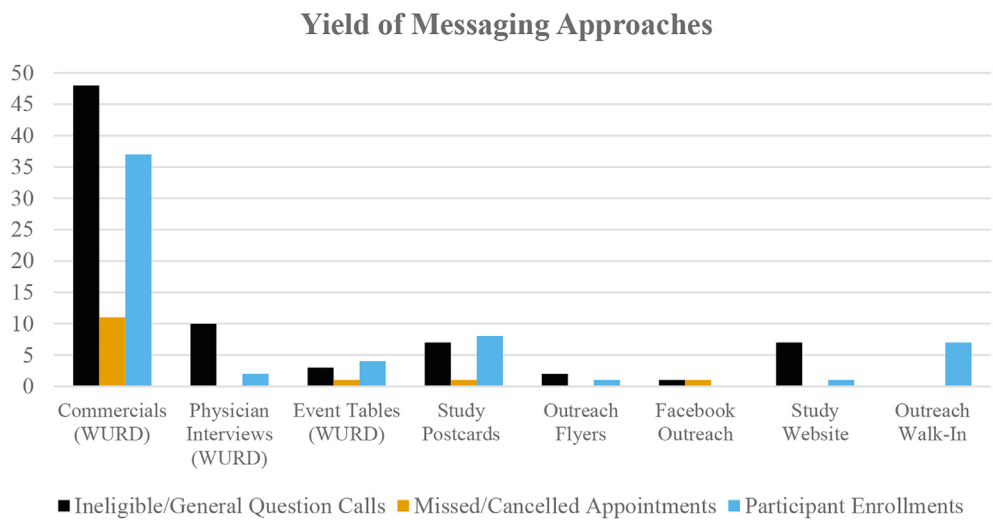

Fig. 2. Yield of each messaging approach in terms of inquiries, from 02/01/2018 to 08/31/2018. Inquiries were categorized as ineligible/general question calls, missed/cancelled appointments, or enrolled patients.

Table 2
Additional Cost and Enrollment Yield of Each Messaging Approach.

	Marketing	Personnel Time	Physician Time	Patient Transport	Additional Cost Total	Enrollment Yield	Cost/Patient
Physician Interviews (W)	$3,500	$863	$63	$14	$4,440	2	$2,220
Event Table (W)	$4,000	$719	$94	$42	$4,855	4	$1,214
Commercials (W)	$25,000	$3,662	$1,002	$448	$30,112	37	$814
Study Postcards	$2,385	$913	$94	$42	$3,434	8	$429
Study Website	$0	$249	$31	$14	$294	1	$294
Outreach Flyers	$0	$205	$0	$0	$205	1	$205
Show Sponsorship (W)	$6,000	$25	$0	$0	$6,025	0	N/A
Patient Testimonials (W)	$3,500	$50	$0	$0	$3,550	0	N/A
Live Coverage of Outreach (W)	$3,500	$25	$0	$0	$3,525	0	N/A
E-Newsletter (W)	$3,000	$50	$0	$0	$3,050	0	N/A
Thank You Cards	$0	$75	$0	$0	$75	0	N/A
Facebook Outreach	$0	$25	$0	$0	$25	0	N/A
Total	**$50,885**	**$6,861**	**$1,283**	**$560**	**$59,589**	**53**	

W = WURD Radio Messaging Approach.

(Danford et al., 2017). Such studies are needed to identify new targets for therapeutic intervention, as current treatments only target one disease mechanism (increased eye pressure) with mixed success (Weinreb et al., 2016). Additionally, genetic studies are needed to define subgroups of disease with unique genotypic and phenotypic traits; preliminary studies in our group have already demonstrated the possibility of classifying patients in this manner (Collins et al., 2018). Our campaign originated from the need to increase enrollment in our glaucoma genetics study, which has the long-term goal of addressing this disparity. We also sought to address the immediate need to provide free glaucoma screenings to individuals without access to healthcare providers, detecting disease and providing treatment before vision loss occurs. These efforts, though specific to glaucoma for our purposes, could be applied across a variety of studies and outreach efforts.

We sought to tailor all messaging approaches to African Americans throughout this campaign. Other studies have found that messaging intended for African American peoples, when paired with other disease prevention and community mobilizing efforts, can influence perceptions and health behavior (Hull et al., 2017). Our campaign used images of African American adults on postcards, featured voices of African Americans for radio recordings, and focused on the salience of glaucoma research for African Americans in all approaches. Our Community Outreach Coordinator, an African American with close ties to the Philadelphia community, placed print materials in areas well-frequented by African Americans and connected with African American churches and senior centers for outreach events. Another major asset for our campaign was the partnership with WURD Radio, a trusted media outlet and leader in the Philadelphia African American community. Prior studies have shown that the involvement of community leaders, such as mayors, ministers, and civic group leaders, can positively impact African American study enrollment (Hull et al., 2017; Ochs-Balcom et al., 2011; Horowitz et al., 2009). WURD is the only Black-owned talk radio station in Pennsylvania—and one of only a few in the nation (WURD, 2016). Having been on the air for more than 15 years, WURD seeks to "provide information and solutions that educate, uplift, and inspire" and be a "strong voice for the issues that matter." (WURD Radio, 2019) The station has been under the leadership of President and CEO Sara Lomax-Reese for more than nine years. She was named one of the 100 most influential people in Philadelphia by *Philadelphia Magazine* in 2017 (Burnley et al., 2017). and one of the 11 most influential African Americans in the city by *Philadelphia Tribune* in 2018 (Bailey, 2017). We believe this partnership with a trusted media outlet and leader encouraged individuals to pursue screenings and/or enrollment, which we are further investigating in a qualitative analysis of interviews with participants.

For our campaign, commercials on WURD radio accounted for the majority of inquiries (62%) and enrollments (60%) compared to other messaging approaches. We believe this approach was most effective for several reasons. First, commercials emphasized the impact of glaucoma on health. The first three words of the commercials were "save your sight," before addressing how glaucoma can slowly and silently lead to deterioration of vision. Other studies have also shown that the most

successful messaging educates the public about the direct impact of a disease on health (Jou et al. 2014). The frequency of the commercials likely also contributed to the high rate of inquiries and enrollments. The commercial spots ran a total of 1440 times over a period of five months, while other WURD messaging approaches were broadcast much less frequently. Other studies have also shown that message frequency outweighs content in increasing awareness, as repetitive exposure allows the message to "stand out in a crowded information environment" (Randolph and Viswanath, 2004). From this result, we would recommend radio messaging for studies conducting similar campaigns, but with a focus on high-frequency approaches that directly address how a disease or behavior impacts health.

In terms of cost, print methods were the most inexpensive medium, but contributed less enrollments than the costlier radio approaches. The high cost of radio advertising is a consistent finding across studies (Williams et al., 2012). Thus, if working with limited funds, we recommend an increased emphasis on distributing print materials in locations deemed especially relevant to a campaign (e.g. healthcare institutions or outreach event locations). If we were to repeat our campaign, we would greatly increase the number of postcards distributed at these sites, as the resultant cost increase would be very low. Finally, one other cost consideration that we did not directly measure is the distinction between in-house screenings and outreach events. Approximately one-third of participants were recruited in just two days of outreach screenings, compared to the remainder of patients seen at in-house screenings over a five-month period. Outreach events held in the community not only reduce travel time and cost for participants, but are also more efficient and likely less costly overall.

It is important to note that our campaign was designed to not only meet the health needs of our patient population, but also to consider social and structural constraints. Our team was dedicated to improving accessibility and ensuring comfort for patients involved in the campaign, regardless of appointment or enrollment status. Specific steps included scheduling appointments around patient availability, offering financial assistance with transportation, and directing patients without insurance towards appropriate options for follow-up care. We believe that such a full-scale effort is necessary to complement any messaging approaches. To aid this effort, we are currently conducting a qualitative analysis of interviews with patients who enrolled through this campaign, to better understand incentives for calling, experiences participating in this study, and opinions on genetic research.

This study has several limitations. First, we did not measure actual exposure to messages, limiting our ability to estimate the total audience reached through each modality. While we know the number of inquiries from each messaging approach from the iConnect system, we do not know the total denominator of individuals exposed to the message. In addition, individuals may have heard of the POAAGG study through multiple and indirect channels. A subset of patients (n = 22) were connected to the study through a friend or family member calling on their behalf. It is possible that these interpersonal channels encouraged some patients to attend an outreach event as a walk-in patient, or to enroll in the study at a regular ophthalmology appointment in the clinic. These patients would not be captured by the iConnect system. Finally, while we use frequency as a surrogate for potential exposure, additional precise measurements, such as daily listener counts or surveys assessing exposure to various campaign messages, would contribute to more precise estimates of reach and efficacy of each approach.

Additionally, this study does not track changes in beliefs or awareness due to the campaign. Whether from friends or family members mentioning their experience with the study, or from exposure to a messaging approach, it is possible that a subset of patients did not call our scheduling line, but became more aware of glaucoma risk and the importance of screenings. In future recruitment campaigns, formative and process evaluation surveys would allow for tracking of changes in disease awareness, as well as exposure and research participation perceptions.

Finally, the cost analysis may under- or over-estimate expenses for the campaign. Though we included exact numbers when available, it was necessary to approximate other costs (i.e. personnel time). We recognize that this campaign was relatively costly, which may not be replicable for all research recruitment efforts. However, we are hopeful that the benefit to glaucoma patients both in the short-term and long-term justifies these costs. It is also possible that costs for this campaign could vary in different cities. Overall, our objective for this paper was to share several ways in which community partnerships and service might contribute to more inclusive and diverse research. Each unique approach could independently contribute to this goal.

5. Conclusion

In conclusion, this Philadelphia-wide campaign successfully reached a subset of the African American community in Philadelphia. Over 150 individuals called our study staff, with 60 enrolling in our study—and many more exposed to detailed information about glaucoma. Our results suggest that high-frequency radio commercials and targeted postcard distribution are particularly effective and affordable approaches for connecting with this population. Our study also underscores the power of coupling marketing campaigns with trusted community leaders and organizations, with the appropriate messenger amplifying the message. We hope that this paper helps to provide preliminary enrollment and financial data that can inform future grant applications and clinical research projects, especially for groups who wish to enroll underserved, underrepresented, or overaffected populations requiring early diagnosis.

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CRediT authorship contribution statement

Ava Kikut: Conceptualization, Methodology, Investigation, Writing - original draft, Writing - review & editing. **Marquis Vaughn:** Methodology, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing. **Rebecca Salowe:** Methodology, Writing - original draft, Writing - review & editing, Visualization. **Mohima Sanyal:** Writing - review & editing, Visualization. **Sayaka Merriam:** Methodology, Resources, Investigation, Writing - review & editing. **Roy Lee:** Resources, Data curation. **Emily Becker:** Writing - review & editing, Visualization. **Sara Lomax-Reese:** Resources, Writing - review & editing. **Monica Lewis:** Resources, Writing - review & editing. **Robert Ryan:** Resources, Writing - review & editing. **Ahmara Ross:** Investigation, Resources, Writing - review & editing. **Qi N. Cui:** Investigation, Resources, Writing - review & editing. **Victoria Addis:** Investigation, Resources, Writing - review & editing. **Prithvi S. Sankar:** Investigation, Resources, Writing - review & editing. **Eydie Miller-Ellis:** Investigation, Resources, Writing - review & editing. **Carolyn Cannuscio:** Writing - review & editing. **Joan O'Brien:** Conceptualization, Methodology, Resources, Writing - review & editing, Supervision, Funding acquisition.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmedr.2020.101057.

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