BRIEF COMMUNICATION

Religious Leaders as Trusted Messengers in Combatting Hypertension in Rural Tanzanian Communities

Valencia J. Lambert,[1] Godfrey A. Kisigo,[1] Aneth Nzali,[2] Evarist Laizer,[2] Ndalloh Paul,[3] Louise Walshe,[1] Fredrick Kalokola,[3] Elialilia S. Okello,[4] Radhika Sundararajan,[1,5] Agrey H. Mwakisole,[2] Jennifer A. Downs,[1,3,*] and Robert N. Peck[1,3,*]

BACKGROUND
Hypertension is a growing public health emergency in rural sub-Saharan Africa. Based on the known influence of religious leaders in rural sub-Saharan Africa and our prior research, we explored perspectives of religious leaders on hypertension and potential strategies to improve hypertension control in their communities.

METHODS
We conducted 31 in-depth interviews with Christian (n = 17) and Muslim (n = 14) religious leaders in rural Tanzania. Interviews focused on religious leaders' perceptions of hypertension and how they could play a role in promoting blood pressure reduction. We used interpretative phenomenological analysis, a qualitative research method, to understand religious leaders' perspectives on, and experiences with, hypertension.

RESULTS
Three main themes emerged during analysis. First, we found that perceptions about causes, treatment, and complications of hypertension are influenced by religious beliefs. Second, religious beliefs can enable engagement with hypertension care through religious texts that support the use of biomedical care. Third, religious leaders are enthusiastic potential partners for promoting hypertension control in their communities. These themes were consistent between religion and gender of the religious leaders.

CONCLUSIONS
Religious leaders are eager to learn about hypertension, to share this knowledge with others and to contribute to improved health in their communities.

Keywords: blood pressure; community; hypertension; hypertension diagnosis; hypertension prevention and control; religion

doi:10.1093/ajh/hpab080

Hypertension is the leading modifiable risk factor for early mortality worldwide.[1] The age-standardized prevalence of hypertension among adults is highest in sub-Saharan Africa.[2] In Tanzania, 28% of adults aged 35 and above have hypertension but only 2% of these are aware of their hypertension.[3] Barriers to hypertension awareness and treatment include low trust in biomedical care, unhealthy norms for diet and exercise, and prioritization of spiritual over physical health.[4] Religious leaders, who have previously demonstrated their capacity to increase male circumcision for HIV prevention,[5] may be ideal community partners to promote healthy behavior in sub-Saharan Africa, where 76% of people report confidence in religious institutions, vs. 51% in health systems and 44% in government.[6] However, limited data exist documenting the perspectives of religious leaders on addressing the problem of hypertension. Therefore, this study sought to bridge this knowledge gap by exploring whether religious leaders might be positioned to address barriers to blood pressure reduction in their communities.

METHODS

In January and February 2021, we conducted in-depth interviews in rural areas of the Mwanza region of Tanzania, near Lake Victoria, with religious leaders from the country's 2 major religions, Christianity and Islam. Participants were purposively sampled by visiting each church and mosque in 2 areas and requesting introductions to leaders of both sexes and varying ages within that institution, followed by snowball sampling through religious leaders' referrals. Trained interviewers of the same gender as interviewees performed one-on-one interviews in Kiswahili. Interviews used open-ended questions to explore perspectives on hypertension and roles religious leaders could play in promoting hypertension control.

Correspondence: Robert N. Peck (rnp2002@med.cornell.edu).

*Contributed equally.

Initially submitted March 19, 2021; accepted for publication May 20, 2021; online publication May 22, 2021.

[1]Center for Global Health, Weill Cornell Medicine, New York, New York, USA; [2]Mwanza Christian College, Mwanza, Tanzania; [3]Department of Medicine, Bugando Medical Centre, Mwanza, Tanzania; [4]Mwanza Intervention Trials Unit, National Institute for Medical Research, Mwanza, Tanzania; [5]Department of Emergency Medicine, Weill Cornell Medicine, New York, New York, USA.

© The Author(s) 2021. Published by Oxford University Press on behalf of American Journal of Hypertension, Ltd. All rights reserved. For permissions, please e-mail: journals.permissions@oup.com

Guided by the social ecological framework, we sought to understand how engaging religious leaders to address hypertension in their communities would impact individuals, family members and peers, and the community and social environment.[7,8]

Interviews were digitally recorded, transcribed verbatim, and translated into English. Two investigators (VL and GK) fluent in both Kiswahili and English reviewed transcripts to ensure accuracy of translations. Transcripts were coded using NVivo version 12 (Doncaster, Australia). We used an interpretative phenomenological analysis, a qualitative research method, to understand religious leaders' perspectives on, and experiences with, hypertension.[9,10] Three investigators (VL, GK, and JD) independently read and coded 3 transcripts each to identify *in vivo* codes. Through a collaborative group process, this initial list of codes was refined and applied to all transcripts. Finally, codes were organized into overarching themes to produce a thematic survey with illustrative quotations selected. Ethical permission to conduct this study was obtained from the National Institute for Medical Research (Tanzania) and Weill Cornell Medicine (New York, NY).

RESULTS

We interviewed 31 religious leaders, with a median age of 44 years (range 19–77). Among these leaders, 17 identified as Christians and 14 as Muslims; 14 were female and 17 were male (Supplementary Table S1 online). Only 12/31 (39%) reported ever having their blood pressure measured, although almost all were open to doing so if given the opportunity. Of those who had prior blood pressure measurement, 10/12 (83%) were tested because they were sick or experiencing perceived symptoms of hypertension such as sharp pain in the chest area, rapid heartbeats, fatigue, or shortness of breath.

Major themes that emerged during analysis were: (i) perceptions of hypertension are influenced by religious beliefs, (ii) religious beliefs can enable engagement with hypertension care, and (iii) religious leaders as potential partners for promoting hypertension control in communities (Table 1). These themes were consistent between those who had, and who had not had, their blood pressure measured at least once in their lifetime.

Perceptions of hypertension are influenced by religious beliefs

Three subthemes emerged when participants described their perceptions of the causes, treatment, and complications of hypertension.

Perceptions of the causes of hypertension influenced by religion

A majority of religious leaders reported that the major cause of hypertension is stress, shock, or depression: "*Hypertension is caused by a lot of challenges. A person thinks a lot and a lot of problems have happened to him in his life, so when he keeps on thinking about them, he gets hypertension*" (Muslim woman, age 38). This belief further affected people's perceived risk of hypertension (Table 1, A.ii).

Perceptions of hypertension treatment influenced by religion

The prevalent concept that hypertension was caused by stress or depression frequently led to spiritualized understandings of how to manage hypertension. Hence, many believed that reducing stress was effective treatment: "*Let me say that it can be treated when you first reduce stress…You have to agree with…the things that have already happened. First, you have to accept the sources which caused you to have that situation and leave it to God*" (Muslim man, age 40). In addition, some religious leaders reported that prayers could treat hypertension (Table 1, A.iv).

Perceptions of complications of hypertension influenced by religion

When asked about a hypothetical scenario of a person with hypertension losing consciousness in a church or mosque, both Christian and Muslim leaders stated that their congregants would believe this person had been attacked by demons. Consequently, some leaders stated that the first response to a person losing consciousness would be collective prayer: "*When that situation happens during the mass, most [people] will interpret it as superstitious. And we always pray for them and some of them get better…When you see that you are praying for him but no demons are coming out, you then pour some water on him and place a fan near him*" (Christian man, age 50). Leaders also described perceptions of demonic forces causing hypertension even in the absence of health emergencies (Table 1, A.vi).

Religious beliefs can enable engagement with hypertension care

In contrast to perceptions of hypertension described above, religious leaders also pointed to specific religious texts and general religious beliefs that could enable biomedical care for hypertension.

Religious texts relevant to hypertension

When asked if there were any religious texts that reference hypertension, leaders frequently stated that the Bible or the Qur'an talk about hypertension, classifying it under "diseases with no cure" (Table 1, B.i): "*These scriptures were prophesized by the earlier prophets…even in the Qur'an…these times were prophesized as the end times. That there will be different diseases and there will be no cure for them. One of the diseases is hypertension which has now arisen rapidly*" (Muslim woman, age 56).

Potential for religious beliefs to promote biomedical care

Several religious leaders stated that an individual can rely on God for help and guidance while seeking biomedical care (Table 1, B.ii): "*We should not put God far away; he should be the first one. We should pray to [God] to bless us, but the second step is to check our health*" (Christian man, age 42).

Table 1. Key themes and subthemes from religious leaders' perspectives about hypertension in their communities

Themes	Frequency (*n* = 31)	Representative quotes
A. Perceptions of hypertension are influenced by religious beliefs		
Perceptions of the causes of hypertension influenced by religion	19	i. "Maybe hypertension is caused by a lot of challenges. A person thinks a lot and a lot of problems have happened to him in his life. So, when he keeps on thinking about them, he gets hypertension." (Muslim woman, age 38) "[The source of hypertension] for how I understand, maybe it is just poverty or a difficult situation… I mean it results in a person having stress, thinking of what I can do when my income is low. Then it causes something like hypertension." (Muslim woman, age 52) ii. "[I don't plan to be tested for hypertension because] I believe in God, and I do not have depression." (Christian woman, age 39)
Perceptions of hypertension treatment influenced by religion	10	iii. "Let me say that it can be treated when you first reduce stress… You have to agree with… the things that have already happened. First, you have to accept the sources which caused you to have that situation and leave it to God." (Muslim man, age 40) iv. "For us who are teaching things about faith, we believe that through prayers and believing in God and praying to God [hypertension] can be treated." (Christian man, age 42) "What we are emphasizing is to pray to God so that he can help us with this problem of pressure" (Christian woman, age 44)
Perceptions of complications of hypertension influenced by religion	13	v. "When that situation happens during the mass, most [people] will interpret it as superstitious. And we always pray for them and some of them get better…. When you see that you are praying for him but there are no demons coming out, you then pour some water on him and place a fan near him." (Christian man, age 50) "I think most of the people will think that [an individual losing consciousness in church] is witchcraft." (Christian woman, age 51) vi. "When my mosque members knew about [my hypertension], most of them thought that the demons might have attacked me, but the more I was explaining to them, they got to understand that was a problem of hypertension." (Muslim man, age 64)
B. Religious beliefs can enable engagement with hypertension care		
Religious texts relevant to hypertension	14	i. "The Bible has prophesized that Jesus Christ talked about diseases with no cure. Hypertension has the medicines of controlling it, but not a cure." (Christian man, age 40) "These scriptures were prophesized by the earlier prophets… even in the Qur'an they are there because these times were prophesied as the end times. That there will be different diseases and there will be no cure for them. One of the diseases is hypertension which has now arisen rapidly." (Muslim woman, age 56) "There are a lot of diseases mentioned in the Qur'an. Even that one [hypertension] is there." (Muslim man, age 64)
Potential for religious beliefs to promote biomedical care	5	ii. "We should not put God far away; he should be the first one. We should pray to [God] to bless us, but the second step is to check our health." (Christian man, age 42) "Most of the scriptures encourage the use of medicine. Do not relax. And it is a very serious problem if you don't use medicine." (Muslim man, age 64) "You can be prayed for so that God can make [bearing the illness] easier. When he goes to the hospital, God can just put him at ease until he has healed." (Muslim man, age 40)
C. Religious leaders as potential partners for promoting hypertension control in communities		
Religious leaders stated their knowledge of hypertension was incomplete and they could benefit from further education	11	i. "My understanding about blood pressure, it is a disease which I hear about it but I have never seen a patient with a problem like that. But from the explanations I am hearing, I hear that it is a disease which attacks old people. Now from there, I have not gotten any more explanation about what is the source and how does it affect people." (Christian man, age 57) "In the past I just knew that is only a fat person who gets pressure maybe because he has a lot of fats in his body… But after [I was diagnosed with hypertension], I had to ask myself depending on the body size I had, it was just a normal body size. So, I had to ask them why did I get pressure while I am not fat?" (Christian woman, age 48)
Religious leaders' readiness to be educated and become educators	24	ii. "I have benefited to know what is hypertension, and I need enough education. More education so that I can go and be a leader to other people." (Muslim woman, age 38) "I can do it anywhere even in the church. After receiving the training, I will gather people of different kind and I will explain to them and also educate them." (Christian woman, age 44) "We pick a certain day and come to educate ourselves that there is this problem and get the knowledge and understand and also explain to other people about this information." (Muslim man, age 41) "I have gotten education that personally I am supposed to check my health. That means I will be a good ambassador to other people to make them also check their health and to protect themselves from these complications of hypertension because I have also seen a lot of complications here." (Christian woman, age 38) iii. "I think as a leader; a perfect place is a place of worship because it is where a lot of people meet. It is easy for me to get them and educate them because it is a place where people come together more often than other places." (Christian woman, age 38)

Table 1. Continued

Themes	Frequency (n = 31)	Representative quotes
Congregants' readiness to receive education about hypertension	21	iv. "From what I understand about mosque members, they will be grateful because [hypertension] has been a problem. It has killed a lot of our relatives. It has brought challenges because people connect it with witchcraft." (Muslim woman, age 56) "[Congregants] will feel good because I have given them knowledge about the disease of hypertension." (Christian woman, age 32) "I think they will receive this well because when you are educating someone to avoid something dangerous for his life. He will receive that very well" (Christian man, age 50)
Religious leaders' influence as trusted community messengers	3	v. "When they have come to pray… then they will be told [about hypertension] because that is the place where a lot of people gather…everyone makes an effort to come on Friday, so you can explain to the ones who will be there. Then when they return home, they will also explain to the people who remained at home that there is this and this about hypertension." (Muslim man, age 52) vi. "Religious leaders have a huge contribution to the society because they are the people with an influence… when they talk about something, it can be received quickly." (Muslim man, age 40) "But because I am a leader, I treated myself and I got better. They then believed that it can be treated." (Muslim man, age 64)

Religious leaders as potential partners for promoting hypertension control in communities

Almost all religious leaders stated that they planned to seek testing for hypertension themselves, that their knowledge of hypertension was incomplete, and that hypertension was a major problem in their communities. Additionally, they recognized their potential to partner with health initiatives to address hypertension in their places of worship and broader communities.

Religious leaders reported incomplete knowledge about hypertension. Many religious leaders admitted that they could benefit from more education about hypertension (Table 1, C.i). For example, 1 Christian man stated, "*My understanding about blood pressure, it is a disease which I hear about, but I have never seen a patient with a problem like that. But from the explanations I am hearing, I hear that it is a disease which attacks old people. Now from there, I have not gotten any more explanation about what is the source, and how does it affect people*" (age 57).

Religious leaders' readiness to be educated and become educators All religious leaders expressed a desire to learn and educate their congregations on hypertension (Table 1, C.ii): "*I have benefited to know what is hypertension, and I need enough education. More education so that I can go and be a leader to other people*" (Muslim woman, age 38). Others reiterated this sentiment, stating that religious meetings can be ideal settings to educate communities about health because they leverage already-existing gatherings to reach large audiences (Table 1, C.iii).

Congregants' readiness to receive education about hypertension Leaders also reported that members of their congregations would welcome and benefit from being educated about hypertension (Table 1, C.iv): "*From what I understand about my mosque members, they will be grateful because [hypertension] has been a problem. It has killed a lot of our relatives. It has brought challenges because people connect it with witchcraft*" (Muslim woman, age 56).

Religious leaders' influence as trusted community messengers Religious leaders anticipated dissemination of education provided during religious services to reach people who had not even attended the services: "*When they have come to pray…then they will be told [about hypertension] because that is the place where a lot of people gather…everyone makes an effort to come on Friday, so you can explain to the ones who will be there. Then when they return home, they will also explain to the people who remained at home that there is this and this about hypertension*" (Muslim man, age 52).

Furthermore, some leaders recognized the strong influence they had within their communities (Table 1, C.vi): "*Religious leaders have a huge contribution to the society because they are the people with an influence…when they talk about something, it can be received quickly*" (Muslim man, age 40).

DISCUSSION

Our data illustrate that religious leaders want to learn about hypertension and have high potential to transform religious beliefs from impediments to impetus for hypertension control in communities. Both Christian and Muslim leaders' enthusiasm and perceived community readiness to receive teaching about hypertension highlight the feasibility and acceptability of partnerships with leaders from both religions to improve health. Our findings build on reports from Ghana, Nigeria, the Democratic Republic of Congo, and Uganda describing similar religious misconceptions about hypertension.[11–14] These misconceptions about hypertension are known to delay care-seeking.[15] Religious leaders are ideally positioned to confront these misconceptions and convey accurate messages regarding hypertension to their communities both in Tanzania and in other countries in

sub-Saharan Africa, particularly in rural communities.[16] Our data support Pan-African Society of Cardiology guidelines, which encourage face-to-face education by religious leaders to reduce hypertension.[17]

We report that religious leaders are trusted messengers who, via their wide influence and platform for regular communication, are uniquely equipped to bring health information to their communities. Religious institutions provide both an established place and a strong social network for promoting sustainable, community-wide change. The World Health Organization recently recommended engaging religious leaders as a key action to promote male circumcision in Africa, citing our team's randomized trial that demonstrated the effectiveness of this strategy.[5,18] In this trial and our other work, both Christian and Muslim leaders consistently recognized their influence and the eagerness of their communities to receive health teaching from them.[5,19] As previously reported by Christians with hypertension in Ghana,[20] our data illustrate ways that leaders can encourage people with hypertension to draw on their faith to find realistic hope and self-efficacy for living healthy lives with hypertension.

Controlling hypertension is among the most cost-effective strategies for preventing premature mortality, and effective interventions are urgently needed.[21,22] A systematic review and meta-analysis examining the impact of hypertension prevention interventions in sub-Saharan Africa reported low to medium quality evidence that reducing sodium intake, mass media education campaigns, and physical activity promotion may lead to blood pressure reduction in African adults.[23] Based on our findings and prior experience working with religious leaders for promotion of other health interventions, we hypothesize that leveraging the influence of religious leaders as trusted community messengers can further augment the blood pressure reductions achieved with other blood pressure-reducing interventions in sub-Saharan Africa.

We acknowledge the limitation that our data were collected from only 1 region in Tanzania. However, given our findings' compatibility with prior studies from Tanzania and beyond, and inclusion of leaders from multiple branches of Christianity and Islam, we anticipate these data are broadly representative.

In conclusion, we report that religious leaders are eager to learn about hypertension, to share this knowledge with others, and to contribute to improved health in their communities. Our data support the potential impact of partnerships with religious leaders as trusted community members to promote awareness, treatment, and control of hypertension in sub-Saharan Africa.

SUPPLEMENTARY MATERIAL

Supplementary data are available at *American Journal of Hypertension* online.

FUNDING

We thank the John Templeton Foundation and Weill Cornell Medicine for supporting this project.

ACKNOWLEDGMENTS

We thank Dr Mubarakali Janmohamed, MD, MBBS, MRCP for his thoughtful comments on an earlier draft of this manuscript.

DISCLOSURE

The authors declared no conflict of interest.

DATA AVAILABILITY

The data underlying this article cannot be shared publicly due to the possibility of identifying study participants with a unique story and identifying characteristics. Redacted data will be shared with qualified researchers upon reasonable request to the corresponding author.

REFERENCES

1. Roth GA, Abate D, Abate KH, Abay SM, Abbafati C, Abbasi N, Abbastabar H, Abd-Allah F, Abdela J, Abdelalim A, Abdollahpour I, Abdulkader RS, Abebe HT, Abebe M, Abebe Z, Abejie AN, Abera SF, Abil OZ, Abraha HN, Abrham AR, Abu-Raddad LJ, Accrombessi MMK, Acharya D, Adamu AA, Adebayo OM, Adedoyin RA, Adekanmbi V, Adetokunboh OO, Adhena BM, Adib MG, Admasie A, Afshin A, Agarwal G, Agesa KM, Agrawal A, Agrawal S, Ahmadi A, Ahmadi M, Ahmed MB, Ahmed S, Aichour AN, Aichour I, Aichour MTE, Akbari ME, Akinyemi RO, Akseer N, Al-Aly Z, Al-Eyadhy A, Al-Raddadi RM, Alahdab F, Alam K, Alam T, Alebel A, Alene KA, Alijanzadeh M, Alizadeh-Navaei R, Aljunid SM, Alkerwi A, Alla F, Allebeck P, Alonso J, Altirkawi K, Alvis-Guzman N, Amare AT, Aminde LN, Amini E, Ammar W, Amoako YA, Anber NH, Andrei CL, Androudi S, Animut MD, Anjomshoa M, Ansari H, Ansha MG, Antonio CAT, Anwari P, Aremu O, Arnlov J, Arora A, Arora M, Artaman A, Aryal KK, Asayesh H, Asfaw ET, Ataro Z, Atique S, Atre SR, Ausloos M, Avokpaho EFGA, Awasthi A, Ayala Quintanilla BP, Ayele Y, Ayer R, Azzopardi PS, Babazadeh A, Bacha U, Badali H, Badawi A, Bali AG, Ballesteros KE, Banach M, Banerjee K, Bannick MS, Banoub JAM, Barboza MA, Barker-Collo SL, Barnighausen TW, Barquera S, Barrero LH, Bassat Q, Basu S, Baune BT, Baynes HW, Bazargan-Hejazi S, Bedi N, Beghi E, Behzadifar M, Behzadifar M, Bejot Y, Bekele BB, Belachew AB, Belay E, Belay YA, Bell ML, Bello AK, Bennett DA, Bensenor IM, Berman AE, Bernabe E, Bernstein RS, Bertolacci GJ, Beuran M, Beyranvand T, Bhalla A, Bhattarai S, Bhaumik S, Bhutta ZA, Biadgo B, Biehl MH, Bijani A, Bikbov B, Bilano V, Bililign N, Bin Sayeed MS, Bisanzio D, Biswas T, Blacker BF, Basara BB, Borschmann R, Bosetti C, Bozorgmehr K, Brady OJ, Brant LC, Brayne C, Brazinova A, Breitborde NJK, Brenner H, Briant PS, Britton G, Brugha T, Busse R, Butt ZA, Callender CSKH, Campos-Nonato IR, Campuzano Rincon JC, Cano J, Car M, Cardenas R, Carreras G, Carrero JJ, Carter A, Carvalho F, Castaneda-Orjuela CA, Castillo Rivas J, Castle CD, Castro C, Castro F, Catala-Lopez F, Cerin E, Chaiah Y, Chang JC, Charlson FJ, Chaturvedi P, Chiang PPC, Chimed-Ochir O, Chisumpa VH, Chitheer A, Chowdhury R, Christensen H, Christopher DJ, Chung SC, Cicuttini FM, Ciobanu LG, Cirillo M, Cohen AJ, Cooper LT, Cortesi PA, Cortinovis M, Cousin E, Cowie BC, Criqui MH, Cromwell EA, Crowe CS, Crump JA, Cunningham M, Daba AK, Dadi AF, Dandona L, Dandona R, Dang AK, Dargan PI, Daryani A, Das SK, Gupta R Das, Neves J Das, Dasa TT, Dash AP, Davis AC, Davis Weaver N, Davitoiu DV, Davletov K, De La Hoz FP, De Neve JW, Degefa MG, Degenhardt L, Degfie TT, Deiparine S, Demoz GT, Demtsu BB, Denova-Gutierrez E, Deribe K,

Dervenis N, Des Jarlais DC, Dessie GA, Dey S, Dharmaratne SD, Dicker D, Dinberu MT, Ding EL, Dirac MA, Djalalinia S, Dokova K, Doku DT, Donnelly CA, Dorsey ER, Doshi PP, Douwes-Schultz D, Doyle KE, Driscoll TR, Dubey M, Dubljanin E, Duken EE, Duncan BB, Duraes AR, Ebrahimi H, Ebrahimpour S, Edessa D, Edvardsson D, Eggen AE, El Bcheraoui C, El Sayed Zaki M, El-Khatib Z, Elkout H, Ellingsen CL, Endres M, Endries AY, Er B, Erskine HE, Eshrati B, Eskandarieh S, Esmaeili R, Esteghamati A, Fakhar M, Fakhim H, Faramarzi M, Fareed M, Farhadi F, Farinha CSE, Faro A, Farvid MS, Farzadfar F, Farzaei MH, Feigin VL, Feigl AB, Fentahun N, Fereshtehnejad SM, Fernandes E, Fernandes JC, Ferrari AJ, Feyissa GT, Filip I, Finegold S, Fischer F, Fitzmaurice C, Foigt NA, Foreman KJ, Fornari C, Frank TD, Fukumoto T, Fuller JE, Fullman N, Furst T, Furtado JM, Futran ND, Gallus S, Garcia-Basteiro AL, Garcia-Gordillo MA, Gardner WM, Gebre AK, Gebrehiwot TT, Gebremedhin AT, Gebremichael B, Gebremichael TG, Gelano TF, Geleijnse JM, Genova-Maleras R, Geramo YCD, Gething PW, Gezae KE, Ghadami MR, Ghadimi R, Ghasemi Falavarjani K, Ghasemi-Kasman M, Ghimire M, Gibney KB, Gill PS, Gill TK, Gillum RF, Ginawi IA, Giroud M, Giussani G, Goenka S, Goldberg EM, Goli S, Gomez-Dantes H, Gona PN, Gopalani SV, Gorman TM, Goto A, Goulart AC, Gnedovskaya EV, Grada A, Grosso G, Gugnani HC, Guimaraes ALS, Guo Y, Gupta PC, Gupta R, Gupta R, Gupta T, Gutierrez RA, Gyawali B, Haagsma JA, Hafezi-Nejad N, Hagos TB, Hailegiyorgis TT, Hailu GB, Haj-Mirzaian A, Haj-Mirzaian A, Hamadeh RR, Hamidi S, Handal AJ, Hankey GJ, Harb HL, Harikrishnan S, Haro JM, Hasan M, Hassankhani H, Hassen HY, Havmoeller R, Hay RJ, Hay SI, He Y, Hedayatizadeh-Omran A, Hegazy MI, Heibati B, Heidari M, Hendrie D, Henok A, Henry NJ, Herteliu C, Heydarpour F, Heydarpour P, Heydarpour S, Hibstu DT, Hoek HW, Hole MK, Homaie Rad E, Hoogar P, Hosgood HD, Hosseini SM, Hosseinzadeh M, Hostiuc M, Hostiuc S, Hotez PJ, Hoy DG, Hsiao T, Hu G, Huang JJ, Husseini A, Hussen MM, Hutfless S, Idrisov B, Ilesanmi OS, Iqbal U, Irvani SSN, Irvine CMS, Islam N, Islam SMS, Islami F, Jacobsen KH, Jahangiry L, Jahanmehr N, Jain SK, Jakovljevic M, Jalu MT, James SL, Javanbakht M, Jayatilleke AU, Jeemon P, Jenkins KJ, Jha RP, Jha V, Johnson CO, Johnson SC, Jonas JB, Joshi A, Jozwiak JJ, Jungari SB, Jurisson M, Kabir Z, Kadel R, Kahsay A, Kalani R, Karami M, Karami Matin B, Karch A, Karema C, Karimi-Sari H, Kasaeian A, Kassa DH, Kassa GM, Kassa TD, Kassebaum NJ, Katikireddi SV, Kaul A, Kazemi Z, Kazemi Karyani A, Kazi DS, Kefale AT, Keiyoro PN, Kemp GR, Kengne AP, Keren A, Kesavachandran CN, Khader YS, Khafaei B, Khafaie MA, Khajavi A, Khalid N, Khalil IA, Khan EA, Khan MS, Khan MA, Khang YH, Khater MM, Khoja AT, Khosravi A, Khosravi MH, Khubchandani J, Kiadaliri AA, Kibret GD, Kidanemariam ZT, Kiirithio DN, Kim D, Kim YE, Kim YJ, Kimokoti RW, Kinfu Y, Kisa A, Kissimova-Skarbek K, Kivimaki M, Knudsen AKS, Kocarnik JM, Kochhar S, Kokubo Y, Kolola T, Kopec JA, Koul PA, Koyanagi A, Kravchenko MA, Krishan K, Kuate Defo B, Kucuk Bicer B, Kumar GA, Kumar M, Kumar P, Kutz MJ, Kuzin I, Kyu HH, Lad DP, Lad SD, Lafranconi A, Lal DK, Lalloo R, Lallukka T, Lam JO, Lami FH, Lansingh VC, Lansky S, Larson HJ, Latifi A, Lau KMM, Lazarus JV, Lebedev G, Lee PH, Leigh J, Leili M, Leshargie CT, Li S, Li Y, Liang J, Lim LL, Lim SS, Limenih MA, Linn S, Liu S, Liu Y, Lodha R, Lonsdale C, Lopez AD, Lorkowski S, Lotufo PA, Lozano R, Lunevicius R, Ma S, Macarayan ERK, Mackay MT, MacLachlan JH, Maddison ER, Madotto F, Magdy Abd El Razek H, Magdy Abd El Razek M, Maghavani DP, Majdan M, Majdzadeh R, Majeed A, Malekzadeh R, Malta DC, Manda AL, Mandarano-Filho LG, Manguerra H, Mansournia MA, Mapoma CC, Marami D, Maravilla JC, Marcenes W, Marczak L, Marks A, Marks GB, Martinez G, Martins-Melo FR, Martopullo I, Marz W, Marzan MB, Masci JR, Massenburg BB, Mathur MR, Mathur P, Matzopoulos R, Maulik PK, Mazidi M, McAlinden C, McGrath JJ, McKee M, McMahon BJ, Mehata S, Mehndiratta MM, Mehrotra R, Mehta KM, Mehta V, Mekonnen TC, Melese A, Melku M, Memiah PTN, Memish ZA, Mendoza W, Mengistu DT, Mengistu G, Mensah GA, Mereta ST, Meretoja A, Meretoja TJ, Mestrovic T, Mezgebe HB, Miazgowski B, Miazgowski T, Millear AI, Miller TR, Miller-Petrie MK, Mini GK, Mirabi P, Mirarefin M, Mirica A, Mirrakhimov EM, Misganaw AT, Mitiku H, Moazen B, Mohammad KA, Mohammadi M, Mohammadifard N, Mohammed MA, Mohammed S, Mohan V, Mokdad AH, Molokhia M, Monasta L, Moradi G, Moradi-Lakeh M, Moradinazar M, Moraga P, Morawska L, Velasquez IM, Morgado-Da-Costa J, Morrison SD, Moschos MM, Mouodi S, Mousavi SM, Muchie KF, Mueller UO, Mukhopadhyay S, Muller K, Mumford JE, Musa J, Musa KI, Mustafa G, Muthupandian S, Nachega JB, Nagel G, Naheed A, Nahvijou A, Naik G, Nair S, Najafi F, Naldi L, Nam HS, Nangia V, Nansseu JR, Nascimento BR, Natarajan G, Neamati N, Negoi I, Negoi RI, Neupane S, Newton CRJ, Ngalesoni FN, Ngunjiri JW, Nguyen AQ, Nguyen G, Nguyen HT, Nguyen HT, Nguyen LH, Nguyen M, Nguyen TH, Nichols E, Ningrum DNA, Nirayo YL, Nixon MR, Nolutshungu N, Nomura S, Norheim OF, Noroozi M, Norrving B, Noubiap JJ, Nouri HR, Shiadeh MN, Nowroozi MR, Nyasulu PS, Odell CM, Ofori-Asenso R, Ogbo FA, Oh IH, Oladimeji O, Olagunju AT, Olivares PR, Olsen HE, Olusanya BO, Olusanya JO, Ong KL, Ong SKS, Oren E, Orpana HM, Ortiz A, Ortiz JR, Otstavnov SS, Overland S, Owolabi MO, Ozdemir R, Mahesh PA, Pacella R, Pakhale S, Pakhare AP, Pakpour AH, Pana A, Panda-Jonas S, Pandian JD, Parisi A, Park EK, Parry CDH, Parsian H, Patel S, Pati S, Patton GC, Paturi VR, Paulson KR, Pereira A, Pereira DM, Perico N, Pesudovs K, Petzold M, Phillips MR, Piel FB, Pigott DM, Pillay JD, Pirsaheb M, Pishgar F, Polinder S, Postma MJ, Pourshams A, Poustchi H, Pujar A, Prakash S, Prasad N, Purcell CA, Qorbani M, Quintana H, Quistberg DA, Rade KW, Anwar Rafay AR, Rahim F, Rahimi K, Rahimi-Movaghar A, Rahman M, Rahman MHU, Rahman MA, Rai RK, Rajsic S, Ram U, Ranabhat CL, Ranjan P, Rao PC, Rawaf DL, Rawaf S, Razo-Garcia C, Reddy KS, Reiner RC, Reitsma MB, Remuzzi G, Renzaho AMN, Resnikoff S, Rezaei S, Rezaeian S, Rezai MS, Riahi SM, Ribeiro ALP, Rios-Blancas MJ, Roba KT, Roberts NLS, Robinson SR, Roever L, Ronfani L, Roshandel G, Rostami A, Rothenbacher D, Roy A, Rubagotti E, Sachdev PS, Saddik B, Sadeghi E, Safari H, Safdarian M, Safi S, Safiri S, Sagar R, Sahebkar A, Sahraian MA, Salam N, Salama JS, Salamati P, De Freitas Saldanha R, Saleem Z, Salimi Y, Salvi SS, Salz I, Sambala EZ, Samy AM, Sanabria J, Dolores Sanchez-Nino M, Santomauro DF, Santos IS, Santos JV, Santric Milicevic MM, Jose BPS, Sarker AR, Sarmiento-Suarez R, Sarrafzadegan N, Sartorius B, Sarvi S, Sathian B, Satpathy M, Sawant AR, Sawhney M, Saxena S, Sayyah M, Schaeffner E, Schmidt MI, Schneider IJC, Schottker B, Schutte AE, Schwebel DC, Schwendicke F, Scott JG, Sekerija M, Sepanlou SG, Servan-Mori E, Seyedmousavi S, Shabaninejad H, Shackelford KA, Shafieesabet A, Shahbazi M, Shaheen AA, Shaikh MA, Shams-Beyranvand M, Shamsi M, Shamsizadeh M, Sharafi K, Sharif M, Sharif-Alhoseini M, Sharma R, She J, Sheikh A, Shi P, Shiferaw MS, Shigematsu M, Shiri R, Shirkoohi R, Shiue I, Shokraneh F, Shrime MG, Si S, Siabani S, Siddiqi TJ, Sigfusdottir ID, Sigurvinsdottir R, Silberberg DH, Santos Silva DA, Silva JP, Da Silva NT, Silveira DGA, Singh JA, Singh NP, Singh PK, Singh V, Sinha DN, Sliwa K, Smith M, Sobaih BH, Sobhani S, Sobngwi E, Soneji SS, Soofi M, Sorensen RJD, Soriano JB, Soyiri IN, Sposato LA, Sreeramareddy CT, Srinivasan V, Stanaway JD, Starodubov VI, Stathopoulou V, Stein DJ, Steiner C, Stewart LG, Stokes MA, Subart ML, Sudaryanto A, Sufiyan MB, Sur PJ, Sutradhar I, Sykes BL, Sylaja PN, Sylte DO, Szoeke CEI, Tabares-Seisdedos R, Tabuchi T, Tadakamadla SK, Takahashi K, Tandon N, Tassew SG, Taveira N, Tehrani-Banihashemi A, Tekalign TG, Tekle MG, Temsah MH, Temsah O, Terkawi AS, Teshale MY, Tessema B, Tessema GA, Thankappan KR, Thirunavukkarasu S, Thomas N, Thrift AG, Thurston GD, Tilahun B, To QG, Tobe-Gai R, Tonelli M, Topor-Madry R, Torre AE, Tortajada-Girbes M, Touvier M, Tovani-Palone MR, Tran BX, Tran KB, Tripathi S, Troeger CE, Truelsen TC, Truong NT, Tsadik AG, Tsoi D, Tudor Car L, Murat Tuzcu E, Tyrovolas S, Ukwaja KN, Ullah I, Undurraga EA, Updike RL, Usman MS, Uthman OA, Uzun SB, Vaduganathan M, Vaezi A, Vaidya G, Valdez PR, Varavikova E, Vasankari TJ, Venketasubramanian N, Villafaina S, Violante FS, Vladimirov SK, Vlassov V, Vollset SE, Vos T, Wagner GR, Wagnew FS, Waheed Y, Wallin MT, Walson JL, Wang Y, Wang YP, Wassie MM, Weiderpass E, Weintraub RG, Weldegebreal F, Weldegwergs KG, Werdecker A, Werkneh AA, West TE, Westerman R, Whiteford HA, Widecka J, Wilner LB, Wilson S, Winkler AS, Wiysonge CS, Wolfe CDA, Wu S, Wu YC, Wyper GMA, Xavier D, Xu G, Yadgir S, Yadollahpour A, Yahyazadeh Jabbari SH, Yakob B, Yan LL, Yano Y, Yaseri M, Yasin YJ, Yentur GK, Yeshaneh A, Yimer EM, Yip P, Yirsaw BD, Yisma E, Yonemoto N, Yonga G, Yoon SJ, Yotebieng M, Younis MZ, Yousefifard M, Yu C, Zadnik V, Zaidi Z, Zaman S Bin, Zamani M, Zare Z, Zeleke AJ, Zenebe ZM, Zhang AL, Zhang K, Zhou M, Zodpey S, Zuhlke LJ, Naghavi M, Murray CJL. Global, regional, and national age-sex-specific

mortality for 282 causes of death in 195 countries and territories, 1980–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018; 392:1736–1788.
2. World Health Organization. Hypertension. https://www.who.int/news-room/fact-sheets/detail/hypertension. Accessed 20 October 2020.
3. Kavishe B, Biraro S, Baisley K, Vanobberghen F, Kapiga S, Munderi P, Smeeth L, Peck R, Mghamba J, Mutungi G, Ikoona E, Levin J, Bou Monclús MA, Katende D, Kisanga E, Hayes R, Grosskurth H. High prevalence of hypertension and of risk factors for non-communicable diseases (NCDs): a population based cross-sectional survey of NCDS and HIV infection in Northwestern Tanzania and Southern Uganda. *BMC Med* 2015; 13:126.
4. Nnko S, Bukenya D, Kavishe BB, Biraro S, Peck R, Kapiga S, Grosskurth H, Seeley J. Chronic diseases in north-west Tanzania and southern Uganda. Public perceptions of terminologies, aetiologies, symptoms and preferred management. *PLoS One* 2015; 10:e0142194.
5. Downs JA, Mwakisole AH, Chandika AB, Lugoba S, Kassim R, Laizer E, Magambo KA, Lee MH, Kalluvya SE, Downs DJ, Fitzgerald DW. Educating religious leaders to promote uptake of male circumcision in Tanzania: a cluster randomised trial. *Lancet* 2017; 389:1124–1132.
6. Tortora B. Africans' confidence in institutions—which country stands out? *Gallup News Service* 2007. https://news.gallup.com/poll/26176/africans-confidence-institutions-which-country-stands-out.aspx.
7. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ Q* 1988; 15:351–377.
8. Bronfenbrenner U. Ecological systems theory. In Vasta R (ed), *Annals of Child Development*, Vol. 6. Jessica Kingsley Publishers: London, UK, 1989, pp. 187–249.
9. Sandelowski M, Barroso J. Classifying the findings in qualitative studies. *Qual Health Res* 2003; 13:905–923.
10. Smith J, Jarman M, Osborn M. Doing interpretive phenomenological analysis. In Murray M, Chamberlain K (eds), *Qualitative Health Psychology: Theories and Methods*. Sage Publications: London, UK, 1999.
11. Odusola AO, Hendriks M, Schultsz C, Bolarinwa OA, Akande T, Osibogun A, Agyemang C, Ogedegbe G, Agbede K, Adenusi P, Lange J, van Weert H, Stronks K, Haafkens JA. Perceptions of inhibitors and facilitators for adhering to hypertension treatment among insured patients in rural Nigeria: a qualitative study. *BMC Health Serv Res* 2014; 14:624.
12. Nyaaba GN, Masana L, Aikins AD, Stronks K, Agyemang C. Lay community perceptions and treatment options for hypertension in rural northern Ghana: a qualitative analysis. *BMJ Open* 2018; 8:e023451.
13. Cremers AL, Alege A, Nelissen HE, Okwor TJ, Osibogun A, Gerrets R, Van't Hoog AH. Patients' and healthcare providers' perceptions and practices regarding hypertension, pharmacy-based care, and mHealth in Lagos, Nigeria: a mixed methods study. *J Hypertens* 2019; 37:389–397.
14. Lulebo AM, Mapatano MA, Mutombo PB, Mafuta EM, Samba G, Coppieters Y. Prevalence and determinants of use of complementary and alternative medicine by hypertensive patients attending primary health care facilities in Kinshasa, Democratic Republic of the Congo: a cross-sectional study. *BMC Complement Altern Med* 2017; 17:205.
15. Liwa A, Roediger R, Jaka H, Bougaila A, Smart L, Langwick S, Peck R. Herbal and alternative medicine use in Tanzanian adults admitted with hypertension-related diseases: a mixed-methods study. *Int J Hypertens* 2017; 2017:5692572.
16. Lugo L, Cooperman A. *Tolerance and Tension: Islam and Christianity in Sub-Saharan Africa*. The Pew Forum on Religion and Public Life: Washington, DC, 2010.
17. Dzudie A, Rayner B, Ojji D, Schutte AE, Twagirumukiza M, Damasceno A, Ba SA, Kane A, Kramoh E, Anzouan Kacou JB, Onwubere B, Cornick R, Sliwa K, Anisiuba B, Mocumbi AO, Ogola E, Awad M, Nel G, Otieno H, Toure AI, Kingue S, Kengne AP, Perel P, Adler A, Poulter N, Mayosi B; PASCAR Task Force on Hypertension. Roadmap to achieve 25% hypertension control in Africa by 2025. *Glob Heart* 2018; 13:45–59.
18. World Health Organization. *Preventing HIV Through Safe Voluntary Medical Male Circumcision for Adolescent Boys and Adult Men in Generalized HIV Epidemics: Recommendations and Key Considerations*. World Health Organization: Geneva, 2020.
19. Sundararajan R, Yoder LM, Kihunrwa A, Aristide C, Kalluvya SE, Downs DJ, Mwakisole AH, Downs JA. How gender and religion impact uptake of family planning: results from a qualitative study in Northwestern Tanzania. *BMC Womens Health* 2019; 19:99.
20. Anyan F, Knizek BL. The coping mechanisms and strategies of hypertension patients in Ghana: the role of religious faith, beliefs and practices. *J Relig Health* 2018; 57:1402–1412.
21. Gaziano TA, Bertram M, Tollman SM, Hofman KJ. Hypertension education and adherence in South Africa: a cost-effectiveness analysis of community health workers. *BMC Public Health* 2014; 14:240.
22. Moran AE, Odden MC, Thanataveerat A, Tzong KY, Rasmussen PW, Guzman D, Williams L, Bibbins-Domingo K, Coxson PG, Goldman L. Cost-effectiveness of hypertension therapy according to 2014 guidelines. *N Engl J Med* 2015; 372:447–455.
23. Wamba AA, Takah NF, Johnman C. The impact of interventions for the primary prevention of hypertension in Sub-Saharan Africa: a systematic review and meta-analysis. *PLoS One* 2019; 14:e0219623.