

COMMENTARY

Open Access

Strategic roles for behaviour change communication in a changing malaria landscape

Hannah Koenker^{1*}, Joseph Keating², Martin Alilio³, Angela Acosta¹, Matthew Lynch¹ and Fatoumata Nafo-Traore⁴

Abstract

Strong evidence suggests that quality strategic behaviour change communication (BCC) can improve malaria prevention and treatment behaviours. As progress is made towards malaria elimination, BCC becomes an even more important tool. BCC can be used 1) to reach populations who remain at risk as transmission dynamics change (e.g. mobile populations), 2) to facilitate identification of people with asymptomatic infections and their compliance with treatment, 3) to inform communities of the optimal timing of malaria control interventions, and 4) to explain changing diagnostic concerns (e.g. increasing false negatives as parasite density and multiplicity of infections fall) and treatment guidelines. The purpose of this commentary is to highlight the benefits and value for money that BCC brings to all aspects of malaria control, and to discuss areas of operations research needed as transmission dynamics change.

Keywords: Malaria, Elimination, Behaviour change communication

Strategic use of behaviour change communication (BCC) applies targeted messages and tailored approaches to promote healthy behaviours and reduced risk taking. BCC, also known as social and behaviour change communication, encompasses health communication, social and community mobilization, and it evolved from information, education and communication (IEC) strategies. With components ranging from interpersonal communication between a community health worker and her client to multi-level mass media campaigns, evidence-based and theory-driven BCC interventions are an integral part of all types of health promotion and disease prevention, and have been shown to significantly improve behaviours, notably in the areas of family planning and HIV prevention [1-7], but also in hygiene and sanitation [8,9], nutrition [10,11], and other disease areas [12-14]. Strategically targeting messages and approaches allows BCC to focus on specific individuals, household, or communities to maximize results of health interventions. This results-based approach to control and prevention has been used in a variety of settings to assess or change behaviour related to malaria, and strong evidence suggests that quality BCC can improve malaria prevention

and treatment behaviours [15-19]. This commentary highlights the benefits and value for money that BCC offers for malaria prevention, treatment and control, given the changing malaria transmission dynamics, and discusses potential areas for operations research.

Behavioural barriers to malaria control are well-documented: inconsistent or non-use of bed nets; delays in seeking effective treatment; and the distribution of intermittent preventive therapy (IPTp) without fully explaining its use to pregnant women, are but a few [20-29]. Adding BCC components to key malaria interventions can help individuals and communities overcome these barriers. BCC also complements the procurement and distribution of malaria commodities, such as long-lasting insecticidal nets (LLINs), rapid diagnostic tests (RDTs), artemisinin-combination therapy (ACT), insecticide for indoor residual spraying (IRS), and drugs for intermittent preventive treatment for pregnant women (IPTp), by ensuring that these commodities are accessed and then used appropriately at the right time, thus protecting investments.

BCC for malaria control increases benefits and value for money

BCC increases the likelihood of a good return on investment for malaria programmes. It increases the likelihood that nets are used, ACT and SP are not wasted, and that

* Correspondence: hkoenker@jhuccp.org

¹Johns Hopkins Bloomberg School of Public Health, Center for Communication Programs, 111 Market Place Suite 310, Baltimore, MD 21202, USA

Full list of author information is available at the end of the article

IRS programmes reach their target coverage levels. BCC is used in malaria control to encourage families to hang and use their nets regularly, care for them and repair them when they're torn, or to create demand for replacing nets on a continuous basis or as part of distribution campaigns. Another key role is informing and mobilizing communities to work with IRS spray teams, to follow instructions during and after spraying, and then promote continued use of LLINs following spraying. Adoption of diagnostic testing of fevers by both consumers and providers is a necessary step for improved treatment and surveillance of malaria, and is critical for the success of the Test, Treat and Track (T3) initiative [30]. BCC is also vital for creating demand for testing and to build trust in results, particularly when patients receive malaria-negative results and are unsure of what to do next. As malaria transmission dynamics change, malaria will cease to be the primary cause of fever and there is an urgent need to improve provider skills in communicating with and counselling patients. Communication campaigns that use interpersonal communication are recommended to improve treatment adherence and demand for and recognition of quality drugs [25,31,32]. BCC promotes ANC attendance and IPTp uptake [33], and training in interpersonal communication is critical for improving the quality of care providers give pregnant women [34].

As countries scale up malaria control and the epidemiology of malaria changes, many areas are seeing decreased transmission and progress toward elimination [35,36]. BCC continues to play important roles when transmission declines. For example, BCC promotes testing and treatment in hotspot areas within Zanzibar, and net and prophylaxis use for travellers, such as in Swaziland [37]. BCC can encourage protective behaviours such as net use even when the risk of malaria is greatly diminished. To support malaria elimination, so-called "hot-pops," reservoirs of infection often not considered when planning control (often adult men, those that work at night, and travellers to endemic areas) will need to also be the focus of interventions, as described in a recent editorial in *The Lancet* [38]. BCC is likely to be crucial for convincing asymptomatic individuals that testing and treatment will help them as well as their communities, and for informing communities about changes in the optimal timing of interventions and the use of new occupation-based vector-control products.

Investment also needed in malaria BCC research

Evidence for malaria BCC effectiveness is growing, but more high-quality data is needed, especially as transmission dynamics change. BCC is a proven intervention, although the bulk of robust evaluations of BCC to date have been focused on other health areas, including family planning and HIV [1-3,5,7,14]. Meta-analyses for family planning and HIV, for example, demonstrate that

targeted behaviours are higher on average among those exposed to mass media interventions [14,39]. Recent analyses using propensity score matching (which simulates experimental designs and produces valid causal inferences using cross-sectional datasets) have shown that net use is 10–15 percentage points higher among those exposed to malaria messages, controlling for all other factors (Boulay M, unpublished data) [19]. It is clear that BCC interventions are most effective when a combination of approaches is used, weaving together mass media, interpersonal communication and structural approaches to promote new or modified behaviours [12,40]. In addition, hearing information from trusted sources has significant effects on behaviour; when combined with evidence of social norms promoted through mass media, these behaviours and attitudes are reinforced [40].

Solid planning must inform BCC interventions so that messages are targeted to key audiences, activities are founded on behavioural theories and formative research, and enough commodities are available to meet the demand generated in the population. The RBM Strategic Framework for Malaria Communication at the Country Level 2012–2017 lays out key steps for evidence-based, strategic behaviour change communication interventions [41]. As countries progress towards eliminating malaria, BCC strategies will need to be updated and adapted as transmission dynamics change and perception of risk is reduced.

Additional data is needed on the effectiveness of BCC for malaria. Research will help to adapt messages and approaches to reduce audience fatigue and to promote new interventions. Malaria behaviours are not static, they change in response to new policies, interventions and messages.

Periodic national cross-sectional household surveys can provide the much-needed data on determinants of malaria behaviours, track the impact of BCC efforts, solidify and inform the evidence base, and allow us to adapt efforts to respond to a changing malaria environment. In Swaziland for example, yearly KAP studies are helping to track progress, monitor the contribution of different communication channels, and focus communication activities on the most at-risk groups [37]. Understanding how perceptions and behaviours change over time will be one of the keys to successful malaria elimination.

Investment in high-quality malaria BCC is good practice, and should be an integral component of malaria control strategies from the start. At the same time, rigorous evaluations are needed to increase the evidence base across different transmission settings. By supporting the use of BCC and research on its effectiveness, donors can be assured of a much stronger return on their investments in malaria control. If in addition to being widely available, those commodities are used properly and consistently, control or elimination of malaria becomes a more attainable goal.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

HK, JK, AA drafted the article. ML, MA and FNT outlined the arguments. All authors read and approved the final manuscript.

Financial Support

This work was supported by USAID under Cooperative Agreement # GHS-A-00-09-00014-00.

Author details

¹Johns Hopkins Bloomberg School of Public Health, Center for Communication Programs, 111 Market Place Suite 310, Baltimore, MD 21202, USA. ²Center for Applied Malaria Research and Evaluation, Tulane University School of Public Health and Tropical Medicine, 1440 Canal Street, Suite 2200, New Orleans, Louisiana 70112, USA. ³United States Agency for International Development, Washington, District of Columbia, USA. ⁴Roll Back Malaria Partnership, Geneva, Switzerland.

Received: 17 July 2013 Accepted: 16 December 2013

Published: 2 January 2014

References

- Bertrand JT, Kincaid DL: *Evaluating Information-Education-Communication (IEC) Programs for Family Planning and Reproductive Health*, Final Report of the IEC Working Group. Chapel Hill: Carolina Population Center, University of North Carolina at Chapel Hill; 1996.
- Westoff CF, Bankole A: *Mass Media and Reproductive Behavior in Africa. DHS Analytical Reports No.2*. Calverton, Maryland: Macro International Inc; 1997.
- Rogers EM, Vaughan PW, Swalehe RM, Rao N, Svenkerud P, Sood S: **Effects of an entertainment-education radio soap opera on family planning behavior in Tanzania.** *Stud Fam Plann* 1999, **30**:193–211.
- Albarracín D, McNatt PS, Klein CT, Ho RM, Mitchell AL, Kumkale GT: **Persuasive communications to change actions: an analysis of behavioral and cognitive impact in HIV prevention.** *Health Psychol* 2003, **22**:166.
- Bertrand JT, O'Reilly K, Denison J, Anhang R, Sweat M: **Systematic review of the effectiveness of mass communication programs to change HIV/AIDS-related behaviors in developing countries.** *Health Educ Res* 2006, **21**:567–597.
- Kaggwa EB, Diop N, Storey JD: **The role of individual and community normative factors: a multilevel analysis of contraceptive use among women in union in Mali.** *Int Fam Plan Perspect* 2008, **34**:79–88.
- Wakefield MA, Loken B, Hornik RC: **Use of mass media campaigns to change health behaviour.** *Lancet* 2010, **376**:1261–1271.
- Curtis V, Kanki B, Cousens S, Diallo I, Kpozehouen A, Sangaré M, Nikiema M: **Evidence of behaviour change following a hygiene promotion programme in Burkina Faso.** *Bull World Health Organ* 2001, **79**:518–527.
- Scott BE, Schmidt WP, Aunger R, Garbrah-Aidoo N, Animashaun R: **Marketing hygiene behaviours: the impact of different communication channels on reported handwashing behaviour of women in Ghana.** *Health Educ Res* 2008, **23**:392–401.
- Ruel MT, Menon P, Habicht JP, Loechl C, Bergeron G, Pelto G, Arimond M, Maluccio J, Michaud L, Hankebo B: **Age-based preventive targeting of food assistance and behaviour change and communication for reduction of childhood undernutrition in Haiti: a cluster randomised trial.** *Lancet* 2008, **371**:588–595.
- Bhutta ZA, Ahmed T, Black RE, Cousens S, Dewey K, Giugliani E, Haider BA, Kirkwood B, Morris SS, Sachdev HP, Shekar M, Maternal and Child Undernutrition Study Group: **What works? Interventions for maternal and child undernutrition and survival.** *Lancet* 2008, **371**:417–440.
- Hornik RC: *Public Health Communication: Evidence for Behavior Change*. Mahwah, NJ: L. Erlbaum Associates; 2002.
- Snyder LB, Hamilton MA, Mitchell EW, Kiwanuka-Tondo J, Fleming-Milici F, Proctor D: **A meta-analysis of the effect of mediated health communication campaigns on behavior change in the United States.** *J Health Commun* 2004, **9**(Suppl 1):71–96.
- Snyder LB: **Health communication campaigns and their impact on behavior.** *J Nutr Educ Behav* 2007, **39**:S32–S40.
- Minja H, Schellenberg JA, Mukasa O, Nathan R, Abdulla S, Mponda H, Tanner M, Lengeler C, Obrist B: **Introducing insecticide-treated nets in the Kilombero Valley, Tanzania: the relevance of local knowledge and practice for an information, education and communication (IEC) campaign.** *Trop Med Int Health* 2001, **6**:614–623.
- Keating J, Hutchinson P, Miller JM, Bennett A, Larsen DA, Hamainza B, Changufu C, Shiliya N, Eisele TP: **A quasi-experimental evaluation of an interpersonal communication intervention to increase insecticide-treated net use among children in Zambia.** *Malar J* 2012, **11**:313.
- Deribew A, Birhanu Z, Sena L, Dejene T, Reda AA, Sudhakar M, Alemseged F, Tessema F, Zeynudin A, Biadgilign S, Deribe K: **The effect of household heads training on long-lasting insecticide-treated bed nets utilization: a cluster randomized controlled trial in Ethiopia.** *Malar J* 2012, **11**:99.
- Shaw W, Baume C, Mwita A: *USAID/Tanzania: Communication and Malaria Initiative in Tanzania (COMMIT) Project Performance Evaluation*. Washington, DC: GH Tech Bridge; 2012.
- Bowen HL: **Impact of a mass media campaign on bed net use in Cameroon.** *Malar J* 2013, **12**:36.
- Korenromp EL, Miller J, Cibulskis RE, Kabir Cham M, Alnwick D, Dye C: **Monitoring mosquito net coverage for malaria control in Africa: possession vs. use by children under 5 years.** *Trop Med Int Health* 2003, **8**:693–703.
- Widmar M, Nagel CJ, Ho DY, Benziger PW, Hennig N: **Determining and addressing obstacles to the effective use of long-lasting insecticide-impregnated nets in rural Tanzania.** *Malar J* 2009, **8**:315.
- Eisele TP, Keating J, Littrell M, Larsen D, Macintyre K: **Assessment of insecticide-treated bednet use among children and pregnant women across 15 countries using standardized national surveys.** *Am J Trop Med Hyg* 2009, **80**:209–214.
- Githinji S, Herbst S, Kistemann T, Noor AM: **Mosquito nets in a rural area of Western Kenya: ownership, use and quality.** *Malar J* 2010, **9**:250.
- Ngondi JM, Graves PM, Gebre T, Mosher AW, Shargie EB, Emerson PM, Richards FO, Ethiopia EM: **Which nets are being used: factors associated with mosquito net use in Amhara, Aromia and Southern Nations, Nationalities and Peoples' Regions of Ethiopia.** *Malar J* 2011, **10**:92.
- Littrell M, Gatakaa H, Evance I, Poyer S, Njogu J, Solomon T, Munroe E, Chapman S, Goodman C, Hanson K, Zinsou C, Akulayi L, Raharinjatovo J, Arogundade E, Buyungo P, Mpasela F, Adjibabi C, Agbango J, Ramarosandratana B, Coker B, Rubahika D, Hamainza B, Shewchuk T, Chavasse D, O'Connell KA: **Monitoring fever treatment behaviour and equitable access to effective medicines in the context of initiatives to improve ACT access: baseline results and implications for programming in six African countries.** *Malar J* 2011, **10**:327.
- Mangham LJ, Cundill B, Achonduh OA, Ambebila JN, Lele AK, Metoh TN, Ndive SN, Ndong IC, Nguela RL, Nji AM, Orang-Ojong B, Wiseman V, Pamen-Ngako J, Mbacham WF: **Malaria prevalence and treatment of febrile patients at health facilities and medicine retailers in Cameroon.** *Trop Med Int Health* 2011, **17**:330–342.
- West PA, Protopopoff N, Rowland MW, Kirby MJ, Oxborough RM, Moshia FW, Malima R, Kleinschmidt I: **Evaluation of a national universal coverage campaign of long-lasting insecticidal nets in a rural district in north-west Tanzania.** *Malar J* 2012, **11**:273.
- Namusoke F, Ntale M, Wahlgren M, Kironde F, Mirembe F: **Validity of self-reported use of sulphadoxine-pyrimethamine intermittent presumptive treatment during pregnancy (IPTp): a cross-sectional study.** *Malar J* 2012, **11**:310.
- Baltzell K, Elfving K, Shakely D, Ali AS, Msellem M, Gulati S, Mårtensson A: **Febrile illness management in children under five years of age: a qualitative pilot study on primary health care workers' practices in Zanzibar.** *Malar J* 2013, **12**:37.
- WHO: *Test. Treat. Track. Scaling up Diagnostic Testing, Treatment and Surveillance for Malaria*. Geneva: World Health Organization; 2012.
- Conteh L, Stevens W, Wiseman V: **The role of communication between clients and health care providers: implications for adherence to malaria treatment in rural Gambia.** *Trop Med Int Health* 2007, **12**:382–391.
- President's Malaria Initiative: *PMI Communication and Social Mobilisation Guidelines*. Washington, DC: USAID; 2008.
- Gies S, Coulibaly SO, Ky C, Ouattara FT, Brabin BJ, D'Alessandro U: **Community-based promotional campaign to improve uptake of intermittent preventive antimalarial treatment in pregnancy in Burkina Faso.** *Am J Trop Med Hyg* 2009, **80**:460–469.
- Shelton D: **The 6 domains of behavior change: the missing health system building block.** *Glob Health Sci Pract* 2013, **1**:137–140.
- O'Meara WP, Mangeni JN, Steketee R, Greenwood B: **Changes in the burden of malaria in sub-Saharan Africa.** *Lancet Infect Dis* 2010, **10**:545–555.

36. Snow RW, Amratia P, Kabaria CW, Noor AM, Marsh K: **The changing limits and incidence of malaria in Africa: 1939–2009.** *Adv Parasitol* 2012, **78**:169–262.
37. Roll Back Malaria: *Focus on Swaziland*. Geneva: Roll Back Malaria; 2012.
38. Cotter C, Sturrock HJ, Hsiang MS, Liu J, Phillips AA, Hwang J, Gueye CS, Fullman N, Gosling RD, Feachem RG: **The changing epidemiology of malaria elimination: new strategies for new challenges.** *Lancet* 2013, **382**:900–911.
39. Snyder LB, Hamilton MA: **A Meta-Analysis of US Health Campaign Effects on Behavior: emphasize enforcement, exposure, and new information, and beware the secular trend.** In *Public Health Communications: Evidence for Behavior Change (p357-384)*. Edited by Hornik R. Hillsdale, NJ: Lawrence Erlbaum; 2002.
40. Boulay M, Storey JD, Sood S: **Indirect exposure to a family planning mass media campaign in Nepal.** *J Health Commun* 2002, **7**:379–399.
41. Roll Back Malaria: *Strategic Framework for Malaria Communication at the Country Level 2012–2017*. Geneva: Roll Back Malaria; 2012.

doi:10.1186/1475-2875-13-1

Cite this article as: Koenker et al.: Strategic roles for behaviour change communication in a changing malaria landscape. *Malaria Journal* 2014 **13**:1.

**Submit your next manuscript to BioMed Central
and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

