Applying Intervention Mapping to develop a community-based intervention aimed at improved psychological and social well-being of unmarried teenage mothers in Uganda

Joanne N. Leerlooijer1*, Gerjo Kok2, Joseph Weyusya3, Arjan E. R. Bos4, Robert A. C. Ruiter2, Liesbeth E. Rijsdijk5, Nathan Nshakira6 and Leona K. Bartholomew7

1Division of Human Nutrition, Wageningen University, Wageningen, The Netherlands, 2Department of Work and Social Psychology, Maastricht University, Maastricht, The Netherlands, 3African Rural Development Initiatives, Manafwa, Uganda, 4School of Psychology, Open University, Heerlen, The Netherlands, 5Windesheim University of Applied Sciences, Windesheim Honours College, Zwolle, The Netherlands, 6Uganda Christian University, Mukono, Uganda and 7School of Public Health, University of Texas, Houston, TX, USA

*Correspondence to: J. N. Leerlooijer. E-mail: joanne.leerlooijer@wur.nl

Received on April 27, 2013; accepted on April 8, 2014

Abstract

Out-of-wedlock pregnancy among adolescents in sub-Saharan Africa is a major concern, because of its association with health, social, psychological, economic and demographic factors. This article describes the development of the Teenage Mothers Project, a community-based intervention to improve psychological and social well-being of unmarried teenage mothers in rural Uganda. We used Intervention Mapping (IM) for systematically developing a theory and evidence-based comprehensive health promotion programme. A planning group consisting of community leaders, teenage mothers, staff of a community-based organization and a health promotion professional was involved in the six steps of IM: needs assessment, programme objectives, methods and applications, intervention design, planning for adoption and implementation and planning for evaluation. The programme includes five intervention components: community awareness raising, teenage mother support groups, formal education and income generation, counselling, and advocacy. The intervention components are based on a variety of theoretical methods, including entertainment education, persuasive communication, mobilization of social networks and social action. In conclusion, IM facilitated the planning group to structure the iterative, bottom-up, participatory design of the project in a real-life setting and to use evidence and theory. The article provides suggestions for the planning of support interventions for unmarried teenage mothers.

Background

Out-of-wedlock pregnancy among female adolescents is a major concern in sub-Saharan Africa. Despite a decline, fertility rates among adolescents aged 15–19 years are still high [1]. Compared with other African countries, Uganda has a high fertility rate of 6.2 children per woman (in 2011), with one out of four females aged 15–19 years giving birth [2]. Complications during pregnancy, abortion and childbirth are leading causes of disability and mortality among female adolescents [3]. A large proportion of teenage pregnancies are out of wedlock and unplanned [2], causing psychological and social consequences including low self-esteem, depression, physical and physiological violence, as well as stigma, isolation, rejection from families,
partners and community members, limited social and financial support, high rates of school dropout and limited career opportunities [3–8].

Studies have researched interventions aiming at primary prevention of teenage pregnancy, HIV/AIDS and other STIs in sub-Saharan Africa [9, 10], prevention of repeat teenage pregnancy [11], maternal health care for teenage mothers [12], and parenting and support for teenage mothers and their children [13]. The findings suggest that these support interventions may be effective when using an ecological, community-based approach taking specific behaviours and contexts into account [14–16]. In low income, sub-Saharan Africa settings few comprehensive intervention are available that are theory and evidence based.

In this article, we describe the participatory planning process of the Teenage Mothers Project, a community-based empowerment intervention aiming at improved psychological and social well-being of unmarried teenage mothers in a rural low-income setting in Eastern Uganda. We defined psychological well-being as the extent to which people feel happy or content with life, encompassing self-acceptance, personal growth, life purpose, environmental mastery, autonomy and positive relationships with others [17]. Social well-being was defined as a sense of involvement with other people and communities, comprising social integration, contribution, coherence, actualization and acceptance [18].

The project planning was guided by Intervention Mapping (IM) [19], which aligns with the increasing acknowledgement to systematically describe the content and planning of complex health promotion interventions [20]. IM describes an iterative process from problem identification to problem solving or mitigation through behavioural and environmental change programmes. IM is characterized by three perspectives: participation of all relevant stakeholders: community members, potential beneficiaries, programme implementers and others with an interest in the health problem and outcomes [21]; using multiple theories and supporting evidence to explain the problem of interest and give guidance for change; and taking an ecological perspective [22] in which impeding environmental factors are converted into problem solving behaviours of actors on interpersonal, community and societal levels that have the power to change these factors.

IM encompasses six steps. Each planning process starts with a needs assessment (Step 1), resulting in a ‘logic model of the problem’, which describes the health problem, impact on quality of life, behavioural and environmental causes, and determinants of these causes. In Step 2, planners identify target groups and prioritize important and changeable objectives. The product is a ‘logic model of change’, composed of behavioural outcomes (desired behaviours of all actors), performance objectives (break down of behavioural outcomes), and change objectives (for determinants of the performance objectives). Planners then select behavioural and environmental change methods and practical applications (Step 3). Methods are theory-based processes influencing change in determinants. Practical applications are operational translations of methods that fit the intervention context and target population and are developed along the evidenced working mechanisms (parameters of use) of the method. In Step 4, integration of applications results in a coherent programme with pilot-tested intervention materials. For programme adoption, implementation and sustainability, planners design implementation interventions (Step 5). Finally, planners design an evaluation plan (Step 6).

**Methods/design**

The six steps of IM and the application to the Teenage Mothers Project planning are described below.

**Step 1: Needs assessment**

Behavioural and environmental causes of out-of-wedlock pregnancy were assessed, a planning group established and existing community structures and resources analysed. The project was introduced following a qualitative study and
literature review in 1999 regarding sexuality and reproductive health of female adolescents in the Manafwa district of Eastern Uganda [23]. The qualitative study involved focus groups and interviews with female adolescents aged 15–19 years ($N=85$). More than half of the participants were not in school and a majority of them had experienced out-of-wedlock pregnancy. Interviews were conducted with community members ($N=12$) including males of various age groups, parents, governmental leaders, and school staff.

**Needs assessment results**

The Eastern region has the highest proportion (almost one out of three) of unintended pregnancies in Uganda [2]. This proportion is higher in poorer households and rural areas. Most unintended pregnancies are out of wedlock, causing inhibiting psychological and social consequences for unmarried teenage mothers [24]. The majority of the out of school female teenagers who participated in the focus group interviews ($N=45$) reported emotional turmoil after out-of-wedlock pregnancy, striving to cope with pregnancy, early motherhood and stigma [23]. Many community members and leaders were not aware of the magnitude and harmful consequences of out-of-wedlock teenage pregnancy in their communities.

Four aspects of stigma [25, 26] were identified in the needs assessment. First, stigmatization had detrimental social and psychological consequences for unmarried teenage mothers (self-stigma); for example, teenage mothers reported limited quality of life, loneliness, low self-esteem, feelings of isolation and lack of social support from peers and parents/guardians. The unmarried teenage mothers had to cope with the father of their child not taking responsibility, with some of the fathers being so-called ‘sugar daddies’ as they lure adolescent girls into sexual liaisons by offering them money or goods [23, 27]. The most important reason for not taking responsibility was fear to be accused of defilement. In Uganda, it is illegal for a man to have sexual intercourse with a female under the age of 18 years [28].

Furthermore, strong social norms rejecting sex and pregnancy outside marital relationships made the unmarried teenage mothers outcasts in their communities (structural stigma), exhibited by stigmatizing attitudes and behaviours of community members towards the teenage mother and her family (public stigma). Community members perceived unmarried teenage mothers as ‘being lost’ [23]. The disapproving attitudes of school administrators, staff and students obstructed continuation of teenage mothers’ education (public stigma). School administrators tended to dismiss female teenagers from school after discovering her pregnancy and to publicly stigmatize them [6]. Finally, many parents (or guardians) felt compelled to send their pregnant daughters away to relatives to mitigate shame and embarrassment (stigma by association).

**Existing community structures and resources**

Existing community structures and resources were analysed through literature and research. The estimated population of the project area, the Manafwa District on the Kenyan border, is approximately 183,000. Most people are Christian, a minority is Muslim. Young people are often unemployed or engaged in temporary or seasonal work in the informal economy. Most people are farmers, some are traders. Socioeconomic standards and literacy rates are low. Sub-county and village leaders are involved in local events, such as burials, weddings and other community meetings. Religious leaders and tribal leaders, including clan leaders and elders, are influential in their respective communities.

**Planning group**

A planning group was established in 2000, with volunteers of the community-based organization African Rural Development Initiatives (ARDI), a health promotion professional (lead author of this article), and community leaders and unmarried teenage mothers in the Manafwa district. Intervention planning and implementation were funded by the Dutch organization Adopteer een Geit (Adopt
The ARDI volunteers originate from the intervention communities and prior to their involvement in the planning group, had experience with implementation of adult literacy and HIV/AIDS community projects. Relevant decision makers in the communities were frequently informed and consulted.

The planning group designed the intervention and added new components between 2000 and 2011. Ideas were generated from teenage mothers and community leaders, discussed, checked with the health promotion professional and implemented on a small scale. If acceptance by implementers and change among beneficiaries were observed, activities were implemented on a larger scale. For example, one of the community leaders provided a plot of land to support teenage mothers’ activities. Data indicated that his contribution was successful and the activity was subsequently reinforced by ARDI staff and copied by other community leaders.

**Step 2: Matrices of change objectives**

The planning group identified the programme beneficiaries and specified three levels of objectives: desired behaviours of all actors (behavioural and environmental outcomes), a breakdown of these behaviours (performance objectives) and change objectives formed by crossing the determinants with performance objectives [19]. Complete overviews of objectives are provided in Supplementary File 1.

**Potential programme beneficiaries**

The planning group decided intervening among teenage mothers, parents, decision makers on community, school, and national levels and members of the community at large. Not fathers of the infants, because teenage mothers tended to shy away if they were asked to disclose those names. They worried about negative consequences from the fathers, powerful relatives or well-known ‘sugar daddies’. If they had a loving relationship with the father, they worried that he would be accused of defilement.

**Behavioural and environmental outcomes and performance objectives**

The behavioural outcomes covered improved coping with stigma and motherhood, continuation of education, increased income generation, abstinence or protected sex and advocacy for the rights of unmarried teenage mothers [5]. Performance objectives for coping with stigma were based on emotion-focused strategies (i.e. regulating negative emotions) and problem-focused strategies (i.e. reconciliation with parents, seeking help and support from counsellors and sharing experiences with other teenage mothers) [29]. Some objectives were added in the course of the project. For example, the behavioural outcome ‘unmarried teenage mothers advocate for their rights’, was added once some teenage mothers had completed higher levels of education. They were deployed as models for others and as advocates for their rights. Examples of behavioural outcomes and performance objectives are listed in Table I.

The planning group decided to target change agents in the community (i.e. environmental agents) who could generate support for unmarried teenage mothers. Examples of environmental outcomes and performance objectives are listed in Table II.

**Determinants and change objectives**

Consideration of determinants of behaviour was based on the results of the needs assessment [23], a literature review and a review of theories [30–32]. A matrix of change objectives was developed reflecting what needed to change in knowledge, attitudes, perceived social influence, skills and self-efficacy among the target audience in order to accomplish the performance behaviours. Examples are presented in Table III. The complete matrices are available in Supplementary File 1.

**Step 3: Methods and applications and Step 4: Programme design**

Steps 3 and 4, selecting methods, applications and designing a programme, were carried out concurrently.
Table I. Examples of behavioural outcomes and performance objectives for unmarried teenage mothers

<table>
<thead>
<tr>
<th>Beneficiaries</th>
<th>Behavioural outcomes</th>
<th>Performance objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmarried teenage mothers</td>
<td>1. Unmarried teenage mothers effectively cope with stigma</td>
<td>1.1. Regulate negative emotions that result from stigma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2. Reconcile relationships with parents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3. Seek help or counselling when needed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4. Share experiences with other unmarried teenage mothers</td>
</tr>
<tr>
<td></td>
<td>2. Unmarried teenage mothers continue their education</td>
<td>2.1. Decide to continue their education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2. Return to primary or secondary school</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3. Attend vocational education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.4. Use own income to contribute to school fees</td>
</tr>
</tbody>
</table>

Table II. Examples of environmental outcomes and performance objectives for environmental agents

<table>
<thead>
<tr>
<th>Beneficiaries</th>
<th>Environmental outcomes</th>
<th>Performance objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents</td>
<td>1. Parents support their daughter to continue education</td>
<td>1.1. Effectively cope with negative norms in society regarding continued education of unmarried teenage mothers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2. Communicate with school administrator to allow their daughter to return to primary or secondary school</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3. Pay school fees and other necessities for daughter to go to school or vocational skills training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4. Care for the baby child when their daughter attends school</td>
</tr>
<tr>
<td>School administrators</td>
<td>1. School administrators support unmarried teenage mothers to continue their education</td>
<td>1.1. Allow unmarried teenage mothers to return to school after pregnancy and delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2. Treat unmarried teenage mothers respectfully</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3. Communicate respectfully with others about unmarried teenage mothers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4. Generate support in the school system for continued education of unmarried teenage mothers</td>
</tr>
</tbody>
</table>

and linked to the objectives in Step 2. Table IV provides examples of methods, applications and their relation to change objectives. The planning group consulted teenage mothers and community leaders and brainstormed about possible activities (applications) with the health promotion professional. Based on available evidence, theoretical methods and their parameters for use were adapted when needed [19]. For example, after discussion in the planning group it was decided to make use of coping models instead of mastery models, increasing the chance that beneficiaries would identify with the model [33]. Applications were implemented on a small scale and monitored. If applications were adopted and
initiated change, the activities were upscaled and incorporated in the intervention.

**Programme components**

The project started in 2000 with the provision of three female goats to 30 unmarried teenage mothers.

One behavioural outcome for teenage mothers was to generate income, with the ultimate aim to contribute to their financial independence and own decision making. Instrumental support [34] was applied as theoretical method and practically implemented by providing goats (application) to

### Table III. Examples of change objectives

<table>
<thead>
<tr>
<th>Beneficiaries</th>
<th>Behavioural outcome (BO)/environmental outcome (EO)</th>
<th>Performance objective (PO)</th>
<th>Change objectives (CO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmarried teenage mothers</td>
<td>Unmarried teenage mothers continue their education</td>
<td>Decide to continue their education</td>
<td>• Express awareness that each female teenager has the right to education</td>
</tr>
<tr>
<td>Parents</td>
<td>Parents support their daughter to continue education</td>
<td>Pay school fees and other necessities for daughter to go to school or vocational skills training</td>
<td>• Express that female and male teenagers have equal rights to be (financially) supported</td>
</tr>
<tr>
<td>Community members</td>
<td>Community members support unmarried teenage mothers</td>
<td>Treat unmarried teenage mothers respectfully</td>
<td>• Explain the magnitude and causes of the pregnancy of unmarried teenage mothers</td>
</tr>
</tbody>
</table>

---

One behavioural outcome for teenage mothers was to generate income, with the ultimate aim to contribute to their financial independence and own decision making. Instrumental support [34] was applied as theoretical method and practically implemented by providing goats (application) to
<table>
<thead>
<tr>
<th>Determinant</th>
<th>Change objective</th>
<th>Theoretical method</th>
<th>Definition</th>
<th>Parameters for use</th>
<th>Beneficiaries</th>
<th>Practical applications</th>
<th>Intervention elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and awareness</td>
<td>Community members describe the harmful consequences of stigma for unmarried teenage mothers</td>
<td>Entertainment education</td>
<td>Providing a form of entertainment designed to educate as well as to entertain</td>
<td>Consideration of source and channel, Balance media professional’s and health promoter’s needs</td>
<td>Community members</td>
<td>Theatre plays and songs performed by teenage mothers</td>
<td>Community awareness raising</td>
</tr>
<tr>
<td>Attitude</td>
<td>Leaders stress the importance of rights of unmarried teenage mothers to be supported to realize their future plans</td>
<td>Persuasive communication</td>
<td>Guiding individuals and environmental agents toward the adoption of an idea, attitude or action by using arguments or other means</td>
<td>Messages need to be relevant and not too discrepant from the beliefs of the individual</td>
<td>Teenage mothers, Parents, School administrators</td>
<td>Interaction during (informal) occasions aimed to convince beneficiaries</td>
<td>All</td>
</tr>
<tr>
<td>Social influence and support</td>
<td>Teenage mothers explain how other teenage mothers cope with social stigma</td>
<td>Mobilization of social networks</td>
<td>Encouraging social networks to provide informational, emotional, appraisal and instrumental support</td>
<td>Availability of social network and potential support givers</td>
<td>Teenage mothers</td>
<td>Emotional, informational and appraisal support</td>
<td>Support groups</td>
</tr>
<tr>
<td>Stigma-related determinants</td>
<td>School administrators convince others that unmarried teenage mothers deserve a second chance</td>
<td>Social action</td>
<td>A form of community organization, based in conflict, in which disenfranchised people wrest power from the official power</td>
<td>Starting where the community is, May be grassroots or professional-driven</td>
<td>Community members, Community leaders</td>
<td>Teenage mothers standing up for their rights, supported by community leaders</td>
<td>Community awareness raising</td>
</tr>
</tbody>
</table>

*Underscored text* = relates to Step 5. Planning adoption, implementation and sustainability.
unmarried teenage mothers. The teenage mothers proposed that goats could provide them with milk for their children and the goats’ offspring could be traded for cows or invested in other ways. Furthermore, ownership of goats would gain respect from relatives and community members. The 30 teenage mothers were grouped in groups of 10 participants, providing an opportunity to share experiences, have contact with peers and provide reproductive health education.

However, in subsequent years, monitoring data showed that goats’ provision and support groups were not sufficient to address psychological and social consequences of out-of-wedlock motherhood. Other practical applications, aimed at providing a supportive social environment, were gradually added and incorporated into one coherent programme. In 2011, the project consisted of five components. The first was ‘community awareness raising’, implemented through a variety of meetings including goats-giving ceremonies organized in each community where a group of teenage mothers received goats. Religious leaders, tribal leaders, village and sub-county leaders, school staff and health care workers were invited and provided speeches, committing themselves to the project and inspiring other community members. Teenage mothers, their parents and the village leader, signed an ownership contract, aimed at the prevention of sale or maltreatment of the goats. Model stories of successful teenage mothers and their parents were included motivating other mothers and parents to support continuation of their daughter’s education and income generation. Teenage mothers performed songs and theatre plays, aiming at community sensitization and attitude change [35]. National members of parliament and representatives of ministries attended the awareness raising meetings advocating for better support for unmarried teenage mothers.

The second component was the teenage mother ‘support group’. Each teenage mother was a member of a teenage mother group from the same community. The groups provided social support and sexual and reproductive health and rights education. One aim was referring teenage mothers to qualified, youth-friendly health services that provide contraceptives, other preventive services, and maternal and post-natal care and check-ups. The third component, ‘livelihood’, was incorporated in the support groups and on the individual level (goat rearing). Increased economic autonomy and education were expected to contribute to increased decision-making power, contributing to improved well-being [36]. ‘Counselling’ was the fourth component regulating teenage mothers’ negative emotions from stigma, reconciliation with parents and persuading parents and teenage mothers to continue formal education [35, 37]. Finally, the fifth component, ‘advocacy’, targeted leaders at all levels, including generating media attention, involvement of leaders in activities, and awareness raising by teenage mothers themselves. Table IV provides examples of methods, parameters, applications, and programme components for each determinant. A complete overview is available in Supplementary File 2.

**General change methods**

A general method we applied was ‘cultural similarity’ [38]. The project deliverers originated from the same tribe and communities as the beneficiaries, contributing to a positive reception of the intervention. Counselling sessions with teenage mothers and parents, and frequent informal individual meetings with community leaders provided opportunities for ‘individualization’ [39]. ‘Participatory problem solving’ throughout the project planning assured that community members and stakeholders shared responsibility and contributed to a change of social norms [38].

**Methods to increase knowledge and awareness and to change attitudes**

In the education sessions of the groups, ‘active learning’ was applied [40]. Awareness about stigma was created through ‘entertainment education’: theatre plays and songs performed by teenage mothers [41]. ‘Persuasive communication’ [40] was applied to change attitudes of teenage mothers, school administrators, parents and community leaders (see Table IV). Messages included: ‘Give
unmarried teenage mothers a second chance’ and ‘Help teenage mothers to continue their education’. The messages aimed to incorporate the community’s disapproval of out-of-wedlock teenage pregnancy as well as teenage mothers’ right to be autonomous and continue their education. These beliefs among community members, parents and leaders were deeply embedded. Messages were therefore more likely effective if they were not too discrepant. The messages corresponded with a national campaign, emphasizing that ‘sexual abuse of girls, and not their immorality’, contributed to their negative social and health outcomes [28]. The persuasive messages were increasingly provided by community leaders. ‘Advocacy’ [42] was used influencing national and district leaders to design and implement laws and policies that support unmarried teenage mothers. Media advocacy was applied by spreading supportive messages about the project in national newspapers and radio stations via local journalists.

Methods to change self-efficacy and skills
Self-efficacy and skills (and attitudes) were changed through ‘modelling’ [33, 43]. In goats-giving ceremonies, parent and teenage mother models provided reasons for adopting the new behaviour (i.e. returning to school, supporting the daughter to return to school), explained how to deal with challenging situations and stated the reinforcing outcomes, such as better education and being valued by others. Successful teenage mothers and parents were publicly rewarded by ARDI staff and community leaders. ‘Guided practice’ was applied by training teachers and community-based volunteers to teach unmarried teenage mothers skills including tailoring, goat keeping and agricultural income generating activities [43].

Methods to change social influence and support
To change social norms, ‘information about the approval of relevant others’ was provided [44]. ‘Mobilization of social networks’ facilitated coping with stigma and other stressful events (see Table IV). ‘Support’ included emotional support by sharing life experiences and providing empathy and caring, instrumental support by providing a goat directly assisting a teenage mother in need, informational support by providing advice and appraisal support by providing information for self-evaluation purposes [34, 45, 46]. For the income generating activities of the support groups ‘contingent rewards’, seeds or other supportive products, were provided when they were successfully implementing activities.

Methods to change stigma-related change objectives
Various methods were identified to reduce stigma [19, 42, 47]. ‘Social creativity’ was applied by shifting the focus of the project from out-of-wedlock pregnancies to the success of teenage mothers’ continued education [48], followed by providing de-stigmatizing ‘stereotype-inconsistent information’. Stereotype-disconfirming model stories were presented, not too discrepant from community members’ views [42, 49]. The model stories included experiences of teenage mothers who were doing well in school, vocational training or income generation. Teenage mothers were encouraged to ‘protest’ and ‘advocate’ for their rights (social action) in ways that would be acceptable for community members and leaders while avoiding unintended rebound effects [42] (see Table IV). Finally, ‘interpersonal contact’ of community members and leaders with unmarried teenage mothers was organized at various occasions, such as the goats giving ceremonies [42, 50].

Step 5: Planning adoption, implementation and sustainability
The aim of Step 5 was to anticipate, from the start, programme adoption, implementation and sustainability. The planning group stated behavioural outcomes for adopters and implementers: community-based volunteers, counsellors, ARDI staff, journalists, tribal and religious leaders, and decision makers and leaders on all levels. Table V
provides examples of behavioural outcomes and performance objectives at the programme user level. Matrices with change objectives are provided in Supplementary File 1.

Adoption and implementation

Interventions were designed addressing programme adoption and implementation. Adoption started with sensitization of tribal, religious and governmental decision makers. They were repeatedly exposed to the project’s messages and to interactions with the teenage mothers, resulting in changed attitudes and supportive behaviour towards the mothers, their parents, other leaders and the community at large. Subsequently they were involved as implementers by giving them a leading role in community meetings and activities of the support groups. Journalists were regularly invited to meetings and community occasions, encouraging them to report about the project.

As a result of the growing number of participating mothers, support groups and other activities, coordinators (community-based volunteers) in each community were appointed to implement activities. Volunteers participated in a 2-week training focusing on knowledge and attitudes, at least 2 weeks of field practice supervised by the ARDI staff (guided practice [43]) aiming at self-efficacy and skills, followed by a 1-week training to merge both training stages. Finally, refresher trainings were organized.

Sustainable implementation

Sustainability was planned for on different levels. Each teenage mother would return one female goat to provide another unmarried teenage mother with a

Table V. Examples of behavioural outcomes and performance objectives for adoption, implementation and sustainability

<table>
<thead>
<tr>
<th>Implementers</th>
<th>Behavioural outcomes</th>
<th>Performance objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community-based volunteers</td>
<td>1. Community-based volunteers provide support to the unmarried teenage mothers</td>
<td>1.1. Organize group meetings with unmarried teenage mothers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2. Provide education on life skills and sexual and reproductive health and rights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3. Initiate and organize income generating activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4. Maintain provision of counselling and support</td>
</tr>
<tr>
<td>ARDI staff</td>
<td>1. ARDI staff provide counselling to teenage mothers and their parents</td>
<td>1.1. Visit and select new unmarried teenage mothers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2. Facilitate reconciliation between unmarried teenage mothers and their parents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3. Maintain provision of counselling and support</td>
</tr>
<tr>
<td>Sub-county and village leaders</td>
<td>1. Sub-county government leaders (Chairman LC 3 and Assistant Secretaries) and village leaders (Chairman LC1) support the Teenage Mothers Project and unmarried teenage mothers</td>
<td>1.1. Convince other leaders, parents and community to support unmarried teenage mothers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2. Use any opportunity to share messages during meetings in the communities (i.e., burials, marriages and circumcision ceremonies)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3. Facilitate the teenage mothers groups by providing land or venues for the meetings and income generating activities</td>
</tr>
</tbody>
</table>
goat. Volunteers did not receive a salary or transport costs but were provided with bicycles and could benefit from the income generating activities of the groups they facilitated. Sustainability of the project is also supported by its adoption by two other organizations in Uganda: Uganda Women Concern Ministry and Phoebe Education Fund for AIDS Orphans who started project implementation in other districts in Eastern Uganda.

Step 6: Planning evaluation
The final step was developing an evaluation plan, including feedback mechanisms to improve implementation. A qualitative effect evaluation was conducted in March 2012 and is described elsewhere [51]. The study showed that between March 2000 and March 2012, 1036 unmarried teenage mothers participated. Almost half of them were still in the project in March 2012. A majority had continued either primary or secondary education, or had joined vocational training institutions. The study showed more supportive community norms regarding unmarried teenage mothers, increased autonomy of teenage mothers and a reinforcing social environment. However, the study showed limited support by parents, traumatic experiences of unmarried teenage mothers during pregnancy and delivery (which could be reduced by intervening earlier), and (financial) barriers to continue with higher education.

Discussion
This article describes the participatory development of a community-based intervention to support unmarried teenage mothers in Uganda. Out-of-wedlock sex and pregnancy and its harmful consequences for teenage mothers are a major concern in sub-Saharan Africa [1]. Concurrently, out-of-wedlock pregnancy is a taboo in many settings, demanding context-sensitive and complex interventions. The Teenage Mothers Project therefore targets a wide range of actors aiming at increased psychological and social well-being of the teenage mothers, and at changing social norms and increasing support in the community. The IM framework provided a structure for iteratively planning this complex intervention, integrating insights from theories and consensus after planning group discussions.

The ‘participatory intervention planning’, one of IM’s key elements, by a community-based organization, community leaders and representatives of the teenage mothers appears to have resulted in a programme that addresses the taboos and that is embedded and acceptable in the local context. The involvement of the planning group, especially the community leaders, can be considered as a significant factor contributing to programme acceptance by the community. The involvement of the health promotion specialist supported the application of relevant theoretical change methods and its parameters for use, contributing to the effectiveness of the programme activities.

An ‘ecological approach’, was applied throughout the planning process by targeting a large variety of groups and intervention implementers, aiming to mitigate harmful consequences of out-of-wedlock pregnancy for teenage mothers from various entry points. The intervention did not only include activities that directly targeted the teenage mothers, but also equally important, included activities that aimed at creating a more supportive social environment. By analysing complex community norms and stigma and its interaction with personal and interpersonal determinants of teenage mothers’ well-being, IM contributed to the identification of individuals with power on various ecological levels and their desired behavioural outcomes.

The Teenage Mothers Project could be used as an example for interventions in similar settings in sub-Saharan Africa and beyond, that also aim to address consequences of out-of-wedlock teenage pregnancy. However, given the context-specific nature of the intervention, planners should be cautious in generalizing the results of the planning process to other populations. Evidence shows that premarital fertility and motherhood are valued differently in other tribal contexts and cultures [52, 53]. Consequences of stigma can differ for teenage mothers with better socioeconomic backgrounds,
in communities where out-of-wedlock pregnancy is less a taboo, or in contexts where laws and policies are more, or less, protective for unmarried teenage mothers. IM provides a framework using the findings of the planning process for adapting the project to other contexts or priority populations taking context-specific needs, barriers and existing structures into account [54].

**Conclusion**

The current article showed that IM provided a useful framework to structure the planning of a community-based, complex intervention aiming at intrapersonal, interpersonal, organizational and social change. Planners of intervention programmes that address sensitive topics such as out-of-wedlock teenage pregnancy can benefit from our experiences in the Teenage Mothers Project in Eastern Uganda by active involvement of influential community members, teenage mothers and their parents, and health promotion professionals in planning of such programmes; by not only addressing needs of unmarried teenage mothers, but also intervening in their social environment, using an ecological approach, to contribute to sustainable change and by systematically applying insights from theories and existing evidence to improve effectiveness of intervention materials and activities.

**Supplementary data**

Supplementary data are available at HERT online.

**Acknowledgements**

We thank the Teenage Mothers Project planning group and the Adopteer een Geit (Adopt a Goat) Foundation for their contributions to the Teenage Mothers Project.

**Conflict of interest statement**

None declared.

References