# 9 Self-management for the prevention and management of Type 2 Diabetes – Insights from low-, middle- and high-income settings


## Summary

Type 2 diabetes mellitus (T2DM) is an increasingly prevalent non-communicable disease that represents a major burden on healthcare systems globally.[170] Low- and middle- income countries (LMICs) are disproportionately affected by diabetes, with around 80% of the adult diabetic population living in these countries[171]. It also represents a major disease burden for socioeconomically disadvantaged people in high income countries (HICs). The SMART2D grant, funded by the European Commission, aimed to implement self-management support for T2DM prevention and management in three different settings (Uganda, South Africa, and Sweden). The project was led by Associate Professor Meena Daivadanam (Uppsala University & Karolinska Institutet, Sweden) and involved researchers from Uganda, South Africa, Finland and Belgium.

**The intervention involved combined community and health facility strategies to enable self-management; however, it was adapted for each setting according to its specific needs and context**. Stakeholders, including policy makers, implementers, representatives of the community, and diabetes associations, were engaged in the project from the outset. Results suggest that **the addition of a community support component was beneficial for people with pre-diabetes in Uganda** rather than for those who already had the disease. Challenges related to implementation of the intervention and high mobility of the target group influenced outcomes in South Africa. **The feasibility trial in Sweden was found to improve reach among hard-to-reach populations through community-based screening**. Thus, SMART2D has generated knowledge regarding implementation of T2DM interventions in each of the settings.

The project has also facilitated research capacity building among early career researchers. Other project outputs included publications, PhD theses, conference proceedings and TV and media coverage.

Two applications are currently pending with the Swedish Research Council for follow-up studies in Uganda and Sweden. In the meantime, project findings have been disseminated to policy, health care and community stakeholders in Uganda, South Africa and Sweden, and **two policy briefs (one each for people with pre-diabetes and diabetes) are being drafted for the Ugandan Ministry of Health to inform national diabetes policy**.


## 9.1 Background

LMICs are disproportionately affected by diabetes with around 80% of the adult diabetic population living in these countries.[172] Prevalence is also increasing among socioeconomically disadvantaged populations in HICs. Considering the numbers of people affected, effectively reaching those in need and managing those who are diagnosed presents challenges for health systems. Strategies for self-management of diabetes and support for healthy lifestyles

[170] Iqbal, N. (2007). The burden of type 2 diabetes: Strategies to prevent or delay onset. In Vascular Health and Risk Management.

[171] Flood D, Hane J, Dunn M, Brown SJ, Wagenaar BH, Rogers EA, et al. Health system interventions for adults with type 2 diabetes in low- And middle-income countries: A systematic review and meta-analysis. PLoS Medicine. 2020.

[172] ibid

have proven to be effective for both prevention and control of diabetes. Yet, implementation has been difficult.

One of the key barriers to implementing interventions that aim to help prevention and control of T2DM is a lack of knowledge and understanding of the environments in which they are to be used and how these in turn modify any interventions that are implemented.[173] Furthermore, interventions that have been developed in a high-income setting are not likely to work in LMIC settings without adaptation. Therefore, there is a need for context-related knowledge prior to intervention adaptation and implementation.

## 9.2 The award

A people-centred approach through Self-Management and Reciprocal learning for the prevention and management of Type-2-Diabetes (SMART2D, 2015 – 2019, €3.3 million) project was funded by the European Commission through the GACD. The project aimed to strengthen capacity for prevention and management of T2DM through strategies including task-shifting to non-physician healthcare providers and community health workers and expanding care networks through community-based support. Work was carried out in three different socioeconomic groupings based in three different countries. The three countries and groupings were Uganda (rural under-serviced areas in a low-income setting), South Africa (urban townships in a middle-income setting), and Sweden (socioeconomically disadvantaged immigrant suburbs in a high-income setting).

*The SMART2D team in 2018*


Source: The SMART2D study team

[173] European Commission. A people-centred approach through Self-Management and Reciprocal learning for the prevention and management of Type-2-Diabetes [Internet]. 2020 [cited 2021 Jun 23]. Available from: https://cordis.europa.eu/project/id/643692/results

The project was led by Associate Professor Meena Daivadanam (Uppsala University & Karolinska Institutet, Sweden), in collaboration with David Guwatudde (Makerere University School of Public Health, Uganda), Thandi Puoane (University of Western Cape School of Public Health, South Africa), Pilvikki Absetz (Collaborative Care Systems Finland) and Josefien Van Olmen (Institute of Tropical Medicine and University of Antwerp, Belgium).

A consultative approach involving three phases was adopted for the study. Whilst the first phase was used to study the local contexts and define the intervention objectives and core strategies, the second and third phases developed and contextualised the framework of interventions for each setting. The generic intervention framework consisted of a facility and a community component. The facility component included organisation of the care process (e.g. minimal and functioning infrastructure, diabetes care guidelines and follow-up system); and strengthening of the patient's role in self-management (e.g. through brief motivational coaching and access to monitoring devices). The community component included community mobilisation, strengthening support from the environment and community extension. Support from the environment, which was a core strategy, had two components: a peer support programme and care companion involvement. These components were developed and contextualised with local key stakeholders for each of the country settings in Uganda, South Africa and Sweden. Adaptive implementation trials were implemented in Uganda and South Africa whereas a feasibility trial was conducted in Sweden.

Stakeholder engagement was actively pursued in all phases of the study, starting with a consultation for initial assessment of priority needs, resources, and opportunities. Workshops with key stakeholders, which included policy makers, implementers, representatives of the community, and diabetes associations, were held in each setting to discuss findings from the situational analyses and transferable learnings from infectious diseases.[174]

Difficulties with project implementation were encountered in the South African setting following student protests that led to intermittent closure of the university.[174] In the Swedish setting, the feasibility study design and sample size had to be changed due to delays following re-organisation within the primary care administration, high staff turnover and change in the format of peer support.

## 9.3 Outputs, outcomes, impacts

The formative phase (Phase 1) led to a greater understanding of current practices and perceptions relating to T2DM. Specifically, in Uganda the results from the formative phase led to an increased understanding of current practices and perceptions, such as dietary practices in relation to diabetes or notions of well-being among participants in rural areas.[175] In South Africa, the first phase highlighted participants' and community health workers' perceptions regarding self-management, whilst in Sweden, there were learnings about the meaning of community, the relevance of high-risk status and mismatch in perceptions about self-management between providers and patients.

Key findings from the implementation of the intervention showed that **addition of a community component to adequately functioning primary care was more beneficial for people with pre-**

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[174] Absetz P, Van Olmen J, Guwatudde D, Puoane T, Alvesson HM, Delobelle P, et al. SMART2D - Development and contextualization of community strategies to support self-management in prevention and control of type 2 diabetes in Uganda, South Africa, and Sweden. Transl Behav Med. 2018

[175] European Commission. A people-centred approach through Self-Management and Reciprocal learning for the prevention and management of Type-2-Diabetes [Internet]. 2020 [cited 2021 Jun 23]. Available from: https://cordis.europa.eu/project/id/643692/results

**diabetes in Uganda and therefore could be potentially useful from a preventative perspective**. Attendance of pre-diabetic participants in the peer support groups in Uganda was lower than for diabetic participants, however overall retention to care was higher in the intervention groups. The **feasibility trial in Sweden which was co-funded by Region Stockholm showed that community-based screening reached hard-to-reach groups better compared to facility-based screening**. In addition, process outcomes for telephone-facilitated health coaching such as acceptability and interaction were good despite some limitations, which need to be addressed in a full trial. In South Africa, major implementation challenges meant that the trial has been unable to demonstrate any significant differences in primary outcomes between the two arms, though retention in care of people with diabetes was better in the integrated care arm with combined facility and community strategies.

**SMART2D has also helped to build research capacity**. The study acted as a training platform for a total of three post-doctoral researchers and nine doctoral students across the six partner institutions. These individuals were partially or wholly funded through other sources including the Swedish International Development Cooperation Agency (Sida).[176]

At least 19 scientific articles (including GACD working group papers) in international peer-reviewed journals within the topic areas of Global Health, Public Health, Diabetes Care or Behavioural Sciences have been attributed to the SMART2D award. Additionally, there have been at least 10 conference proceedings which includes participation in the 6th Global Symposium on Health System Research as well as the European Public Health Conference (2017 and 2018), one book chapter published in the South African Health Review and three PhDs theses based party or wholly on SMART2D.[177]

## 9.4 Potential for future impact

Two main dissemination events were held in Uganda and South Africa. In Uganda, participants included representatives from the Swedish Embassy, the Head of the NCD programme at the Ugandan Ministry of Health, NGOs and WHO representatives. There was significant media coverage.[178] Policy implications of the main findings and lessons from the implementation process were discussed, and the **NCD Programme Head requested a policy brief from the team to help inform the Ugandan Ministry of Health's diabetes policy**. As such, two policy briefs are being planned – one concerning prevention and management in diabetics and the second in pre-diabetics. In South Africa, the study team conducted a community event to raise awareness and disseminate findings. The day was called "Let's Beat It Together" and included presentations from invited guest speakers. In Sweden, a Stakeholder Day was organised during Fall 2018 in connection with the third consortium workshop in Stockholm, where local stakeholders from Primary Care, Citizen's Offices and NGOs participated in a half-day event together with representatives from the European Commission and Global Alliance for Chronic Diseases.

Other channels and media platforms have been used to engage the public including the SMART2D website, SMART2D promotional video, information brochures, radio, TV[179] and written media interviews.

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[176] Daivadanam M, Tomson G. SMART2D WP 7: Continuous policy dialogue.

[177] Daivadanam M, Tomson G. SMART2D WP 7: Continuous policy dialogue.

[178] file:///Users/robertking/Downloads/Attachment_0%20(1).pdf

[179] Youtube link: https://www.youtube.com/watch?v=dUohuXO6fEo&ab_channel=NTVUganda

**Future scale-up of the SMART2D intervention would require additional financial investment** not just to train personnel and leaders of the peer groups (Uganda and South Africa), but also to procure necessary equipment and accessories (at all three sites) and diabetes medication to avoid stock-outs during the trial phase (Uganda). Challenges for future funding therefore differ in the three sites. Two applications are currently pending with the Swedish Research Council for follow-up studies in Uganda and Sweden. In Uganda, the team will explore in depth the role of social support in retention to clinical care and sustained lifestyle behaviours while in the Swedish setting the team is working towards a full implementation trial following on from the feasibility trial in order to see if the intervention is effective and can have a sustainable impact.

The SMART2D project illustrates the iterative nature of implementation science. As Meena Daivadanam says: "*Implementation of interventions is a process of navigating many unknowns and requires several cycles for interventions to be optimised, and we are not there yet. In SMART2D, we set out to understand the added benefit of a community component for type 2 diabetes and found that it was mostly beneficial for individuals at high-risk rather than for those with established disease. There is really no short cut for an adequately functioning primary care for chronic disease management, but communities need to come together for prevention; and as a society, we should find ways to harness that whether it is through peer support, participatory action or co-creation*."