Formative Process and Value-Based Evaluation of the Wave 1 Roll-Out of the All Wales Diabetes Prevention Programme.

Report by the Swansea, Aberystwyth, Bangor University (SABU) Consortium

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The authors have been responsible for all data collection, analysis and interpretation and for writing up their work. The authors participated in monthly meetings with the AWDPP team and members of Public Health Wales Research & Evaluation Division for the purpose of reporting progress of the evaluation. Provisional findings were only provided to the funder and AWDPP team in the first draft of the report presented in March 2023.

Delegated representatives of Public Health Wales and the AWDPP have commented on this report in two rounds of review, along with our public contributors. We would like to thank the reviewers for their constructive comments on these draft iterations, which the authors have read and where appropriate accommodated in the production of this final report.

This final report represents an independent evaluation of the All Wales Diabetes Prevention Programme (AWDPP) by the authors. The views and opinions expressed in this report are those of the authors and do not necessarily reflect the views and opinions of the AWDPP team and constituent boards, NHS Wales University Health Boards or Public Health Wales. Any verbatim quotes provided in the report are the views and opinions of the participants who took part in the evaluation and do not necessarily represent those of the authors, AWDPP team and constituent boards, NHS Wales University Health Boards or Public Health Wales.

Declaration of interests.
The SABU consortium authors declare they have no competing interests. L Kosnes (until 01.10.2022), P Anderson, S Harris and D Fitzsimmons are members of Health and Care Economics Cymru (HCEC), who supported the time for these individuals to write the original tender (LK, PA, SH and DF) and support writing up (PA, SH, DF). HCEC is funded by Welsh Government through Health and Care Research Wales.

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- AWDPP Cluster Leads across the participating NHS Wales Health Boards
- The Health Care Support Workers (HCSWs), and dietitians who delivered the AWDPP in the participating sites.

Participants in the evaluation
- All Health Care Professionals who participated in the evaluation
- The service users who participated in the evaluation.

Our public contributors, Barbara Harrington and Jan Davies

Lay Summary

What is the All Wales Diabetes Prevention Programme?
The All Wales Diabetes Prevention Programme (AWDPP) has been designed especially for people who are at risk of developing type 2 diabetes. This short programme offers a one to one conversation about lifestyle, especially changes in eating and physical activity level that might prevent or delay the onset of type 2 diabetes. Some people are then referred for further support to help with managing weight and increasing physical activity, and also to find out more about type 2 diabetes.

What is this report about?
The programme is new and we were asked by Public Health Wales to find out how well it was implemented and what lessons could be learned for future roll-out. To do this, we sought the views of service users, health care professionals and senior managers involved in the first phase of rolling out this programme across Wales. We used surveys, interviews, focus groups as well as observing some of the conversations and looking at available records and the documents used in planning and delivering the programme.

What did we find out?

- The practicalities of rolling out the programme (finding appropriate meeting space, recruiting and training staff, identifying at risk people to invite) took a lot more time and effort than expected and led to delays in the programme starting.
- All staff expressed enthusiasm and support for the programme.
- Service users valued having an appointment tailored to their individual needs and were willing to make changes in their lifestyle.
- Many service users did not previously know they were at risk of developing type 2 diabetes.
- Many people aged over 80 were felt to be clinically inappropriate for the programme.
- People with higher body mass index (BMI) / weight were less likely to accept or attend the appointment offered.
- Looking at who was referred for further support, we found:
    - People over 70 were less likely to be referred for further support
    - Those living in the least deprived areas had most referrals
    - More women than men were referred
- Local availability of services and individual need or preferences could play a part in who was referred for additional support.

Did the Health Boards deliver the agreed national programme?
On the whole, yes.
There were some differences in choosing who to invite to take part. These differences led to more people aged over 80 and, in some areas, those who are very overweight being excluded.

What challenges need to be managed going forward?

- Lack of Lead Dietitian time to support the programme
- Having access to and knowing how to use GP computer systems
- Staff turnover and grading of key posts
- Relationships with GP practices
- Lack of public and professional awareness of the programme

Further information that could help improve the programme

- It would be helpful to find out what difference service users feel the programme has made to their health and quality of life, and also
- the reasons why some people did not take up the offer of the programme.

Abbreviations

AWDPP: All Wales Diabetes Prevention Programme

BMI: Body Mass Index

CCA: Cost-consequence analysis

COM-B: Capability, Opportunity, Motivation and Behaviour

DPIA: Data Protection Impact Assessment

DPP: Diabetes Prevention Programme

EQ-5D 5L: EuroQoL 5 Dimension 5 Level Questionnaire

FTE: Full time equivalent

F2F; Face-to-face

GMS: General Medical Services

GP: General Practice

HB: Health Boards

HbA1c: Glycated haemoglobin

HCSW: Healthcare Support Worker

HCPs: Health Care Professionals

HRQoL: Health Related Quality of Life

IG: Information Governance

IMTP: Integrated Medium Term Plan

IT: Information Technology

LD: Lead Dietitian

LOSA: Lower Level Super Output Area

MRC: Medical Research Council

NERS: National Exercise Referral Scheme

NHS: National Health Service

NICE: National Institute for Health and Care Excellence

PCC: Primary Care Cluster

PHW: Public Health Wales

PREM: Patient Related Experience Measure

PROM: Patient Reported Outcome Measure

QR: Quick Response

RE-AIM: Reach, Effectiveness, Adoption, Implementation and Maintenance Framework

R&D: Research and Development Directorate/Department

THB: Teaching Health Board

TIDieR: Template for intervention description and replication

ToC: Theory of Change

T2DM: Type 2 Diabetes Mellitus

SABU: Swansea, Aberystwyth, Bangor University Consortium

SAIL: Secure Anonymised Information Linkage

UHB: University Health Board

VHBC: Value-based Health Care

WIMD: Welsh Index of Multiple Deprivation

Contents

Executive Summary

This report presents a formative process and value-based evaluation of the Wave 1 roll-out of the All Wales Diabetes Prevention Programme (AWDPP) funded by Public Health Wales (PHW).

Background

In Wales, the national diabetes prevention programme based on a brief lifestyle intervention was developed following pilot work conducted in the Afan Valley and North Ceredigion primary care clusters. The AWDPP intervention consists of systematic identification of adults at risk of developing Type 2 Diabetes Mellitus (T2DM) identified through HbA1c measurement of between 42 to 47 mmol/mol, i.e., prediabetes range and offering a 30-minute person-centred lifestyle conversation (delivered face-to-face, by phone or by video call) focused on diet and physical activity levels. The intervention has been designed to be delivered by a designated Healthcare Support Worker (HCSW) who has received essential training to facilitate delivery of the AWDPP intervention. Service users may then be referred on to existing health promotion / lifestyle modification programmes such as the National Exercise Referral Scheme (NERS), weight management services, or the Let's Prevent Diabetes interactive digital education programme.

The national roll-out of the AWDPP is led by the Primary Care Division, Public Health Wales (PHW) and delivered by local Health Board community dietetic teams, through primary care clusters within each of the seven Health Boards across Wales.

Objectives

The overall aim of the formative process and value-based evaluation was to examine the implementation of the AWDPP intervention across local Health Boards in Wales during the initial (Wave 1) roll-out, by identifying contextually relevant strategies for successful implementation and practical difficulties and facilitators in adoption, delivery and maintenance to inform wider implementation. The key objectives were to:

- Conceptualise the intervention context.
- Understand the intervention delivery and implementation.
- Examine the mechanisms of impact.
- Explore the value of the intervention, in line with Wales Prudent Healthcare Principles.

Summary of methods

This formative process and value-based evaluation was undertaken to ascertain the views on the AWDPP intervention from service users, health care professionals and key stakeholders. The formative evaluation was informed by the Medical Research Council (MRC) Framework for Process Evaluation, the Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) Framework and Wales Prudent Health Care principles.

Ethical approval was obtained from NHS Wales Research Ethics Committee 3 (Reference:22/WA/0159) and all local Health Boards gave the necessary research permissions for the evaluation to be conducted in the relevant setting. All interview and focus group participants gave written informed consent to take part. All methods were carried out in accordance with relevant guidelines and regulations or Declaration of Helsinki.

A mixed methods approach was taken to data collection and analysis. The following methods of data collection were utilised:
1) surveys of General Practice stakeholders and service users taking part in the AWDPP,
2) interviews and/or focus groups with key stakeholders and service users,

3) clinic observations,
4) analysis of anonymised routine clinical and administrative data from the SAIL (Secure Anonymised Information Linkage) databank and AWDPP service user database, and
5) a review of programme documents during the planning and delivery of the AWDPP.

Sampling was purposive to ensure representation from communities across Wales, whilst maintaining achievable outcomes within the evaluation period.

Surveys of stakeholders and service users
All General Practices (GPs) within the AWDPP funded cluster areas were invited to complete an online survey. The GP survey measured the process of implementation from the perspectives of GP staff directly and indirectly involved in implementing the AWDPP. Service User Questionnaires or links to it were distributed by the Health Care Support Worker (HCSW) at the end of face-to-face appointments. Those who had a telephone or video appointment were sent the link to the online questionnaire via email, or the paper questionnaire after the appointment.

Interviews and/or focus groups with stakeholders and service users
Additional data was collected through one-to-one interviews and focus groups with key stakeholders including lead dietitians and HCSWs delivering the AWDPP, and national, local Health Board and PHW strategic leads. Service users who completed a questionnaire and expressed an interest to take part in further research were invited to take part in a focus group or one to one interview.

Clinic observations
An observer from the evaluation team sat in on all appointments during a pre-arranged clinic in one cluster. An observation checklist was completed, and field notes made of any variations to the original programme protocol during the observed clinic and where variations to the programme were observed.

Routine clinical and administrative data
A Service User Database was populated by the healthcare professionals delivering the intervention which recorded basic demographic data, any reason for excluding potentially eligible service users, service user response to the invitation (including reason for decline) and any referral onto support services following the AWDPP appointment. A minimum dataset containing anonymised service user level data, made available for the evaluation via the SAIL Databank was also analysed. This minimum dataset was linked with other health records within SAIL such as the Welsh Index of Multiple Deprivation (WIMD)***.***

Document review
Information relating to the context of the AWDPP delivery that may affect the implementation was documented. Information was reviewed, and relevant information extracted into a timeline documenting the key milestones of the Wave 1 roll-out.

Value-based health economic assessment
As part of the value-based assessment, a preliminary cost-consequence analysis (CCA) was conducted to understand the short-term economic impact of the implementation of the programme and to estimate what data will be required for a full economic evaluation in the future.

Key Findings

1. Delivering the AWDPP across all seven Health Boards and in the initial 14 funded clusters has presented implementation challenges, as would be expected when embedding a new national prevention programme into primary care. Despite these challenges there was significant enthusiasm and support for the AWDPP throughout the Health Board teams in all roles and at all levels.

2. On the whole, the national protocol has been implemented as planned, across the majority of Health Boards, with one notable exception where the Health Board had already planned to implement a Diabetes Prevention Programme Health Board wide and adopted the majority of the national protocol with some local modifications.

3. Service User Involvement:
   - Between June to December 2022, 3,158 people were identified as at risk of developing T2DM and potentially eligible to take part in the programme across 29 GP practices.
   - During the evaluation period, 1,968 people were invited to take part in the programme. However, the programme was deemed clinically inappropriate for 19% of people originally identified as at risk of developing T2DM and they were not invited to take part.
   - At the end of December 2022, 1,015 people (52%) had accepted an appointment, 265 (13%) had declined and 688 (35%) had not responded to the invitation. Both BMI and weight were found to have a significant effect on whether a person accepted or attended an appointment with those with higher BMI / weight less likely to accept or attend an appointment.
   - A total of 801 appointments were delivered either face-to-face or virtually and 68% of those who attended an appointment were referred to additional support services.

4. Our survey findings indicate that the AWDPP was highly valued by service users in providing an appointment tailored to their own personal needs, and there is evidence that service users were willing to make lifestyle changes to address their risk factors.

5. Nearly half of those who attended an AWDPP appointment and completed the service user survey were unaware they were at risk of developing T2DM before receiving information about the programme.

6. There is evidence of some deviation from the original protocol with all Health Boards escalating service users over the age of 80 years for review. The agreed protocol is to escalate individuals over the age of 85 years for review. A large proportion of those escalated are being excluded from the programme. There is also evidence that four Health Boards are escalating people with a BMI over 40kg/m^2, and in some cases excluding them. This may be to refer individuals on to specialist weight management services rather than the AWDPP but there was some concern that weight management services were already busy and attending the AWDPP session might be helpful as a short-term intervention.

7. Based on the available information on activity up to December 2022, the estimated protocol based cost per AWDPP service user is £312. This includes the cost of follow up HbA1c and appointment at 12 months after initial appointment. As the roll outs continue and the AWDPP beds into practice its probable that the cost per user will fall.

8. The data suggests some variation in referral to support services being offered, e.g., those aged over 70 had a lower referral rate than younger people, those living in the least deprived areas had the highest referral rate and females had a higher referral rate than males. These variations may be related to local provision (e.g., availability of local services) or personal need/choice (e.g., tailoring to the user).

Considerations going forward

Challenges for the programme that could be further addressed include: lack of Lead Dietitian time, training and access to primary care IT systems, staff turnover and banding of HCSWs, relationships with primary care practices, public and professional awareness of the programme.

Our evaluation has also shown the potential to include patient reported outcomes such as Health Related Quality of Life (HRQOL) using the EQ-5D 5L questionnaire to capture the impact that a diabetes prevention intervention makes to people and populations.

Further exploration could be undertaken to understand the reasons why eligible service users, particularly those from areas of high deprivation or with a high BMI, did not take up the AWDPP intervention.

Strengths and limitations of this evaluation

A strength of our qualitative research was the inclusion of a wide range of stakeholders, delivery staff and service users to make sure all aspects of the Wave 1 AWDPP programme implementation was represented. However, there were limitations in the numbers included due to the unforeseen time needed for programme set up in a complex delivery landscape and the time available to carry out the formative process evaluation. Incomplete data recorded in primary care records meant we were unable to undertake analysis on differences in how the AWDPP has been delivered across ethnicities and across disability status. We were therefore unable to make any comments on these equity concerns. These limitations, however, were unlikely to impact research credibility.

Conclusions

At this stage in the roll-out of Wave 1 of the AWDPP, the intent to provide and deliver the programme in line with Prudent Healthcare is successful, delivering against all four principles and is promising in terms of demonstrating value**.** Our findings indicate that from the voice and opinions expressed by service users who took part in the survey and/or interview, the AWDPP matters to them; raising awareness, promoting knowledge and capacity to change behaviours and motivate and raise confidence in those identified at risk of T2DM. Whilst it is premature to make any indication as to how this translates into longer term service user / patient reported outcomes, the experience of the AWDPP for those who took part in the evaluation fulfils personal value as a model of preventative health aimed at reducing risk of T2DM. Inevitably, as this is a big, ambitious and complex programme to roll-out in a short period of time, there have been some challenges. We have offered points for consideration and our findings can be used to inform the subsequent phases of the AWDPP roll-out across Wales.

1 Introduction

Type 2 diabetes (T2DM) is a progressive, chronic condition affecting approximately 4.7 million people across the UK with an estimated further 12.3 million at risk of developing the condition [1]. Non-diabetic hyperglycaemia (also termed prediabetes), a condition characterised by higher-than-normal blood glucose levels, puts the individual at high risk of developing T2DM and its associated complications. The International Diabetes Federation estimate that between 26% and 50% of people with prediabetes will progress to T2DM within 5 years of diagnosis, with the rate of progression dependent on the severity of hyperglycaemia at diagnosis and other risk factors such as age and weight [2]. However appropriate modification of the risk factors associated with T2DM, can prevent or delay development of T2DM [3]. Studies that utilise lifestyle modification have demonstrated that the prevention of progression of T2DM can last for 10 years and longer [2].

In Wales, the national diabetes prevention programme based on a brief lifestyle intervention was developed [4] following pilot work conducted in the Afan Valley and North Ceredigion primary care clusters [5]. The AWDPP intervention is based on the Transtheoretical Stages of Change model [6], and the COM-B implementation framework [7]. The intervention consists of systematic identification of adults at risk of developing T2DM (identified through HbA1c measurement of between 42 to 47 mmol/mol, i.e., prediabetes range) and offering a 30-minute person-centred lifestyle conversation (delivered face-to-face (F2F), by phone or by video call) focused on diet and physical activity levels. The intervention has been designed to be delivered by a designated Healthcare Support Worker (HCSW) who has received essential training to facilitate delivery of the AWDPP intervention [8]. Service users may then be referred on to existing health promotion / lifestyle modification programmes such as the National Exercise Referral Scheme (NERS), weight management services e.g., Foodwise for Life, or the Let's Prevent Diabetes interactive digital education programme. Programme delivery of the AWDPP was anticipated to start on 1st April 2022 with the evaluation commissioned to run from January 2022 to March 2023.

2 Evaluation Aim and Objectives

The purpose of the formative process and value-based evaluation presented in this report is to provide a comprehensive understanding of the implementation of Wave 1 of the AWDPP to inform subsequent roll-out.

The objectives were to:

- Conceptualise the intervention context.
- Understand the intervention delivery and implementation.
- Examine the mechanisms of impact.
- Explore the value of the intervention, in line with Wales Prudent Healthcare Principles [9].

Our evaluation comprised of 3 key stages:

1. Evaluation set up (January to July 2022): During this phase, we established the networks/relationships with the AWDPP team and key stakeholders. The evaluation protocol was developed alongside the accompanying data collection tools. Ethics, research and information governance permission were secured.
2. Evaluation conduct (September 2022 to Jan 2023): Recruitment and data collection was undertaken.
3. Evaluation analysis and reporting (February to May 2023): Data analyses were undertaken. A draft report was produced and reviewed by our public contributors and representatives from the AWDPP programme delivery team and Research & Evaluation Division within PHW in two rounds of feedback and revision to produce a final version of the report.

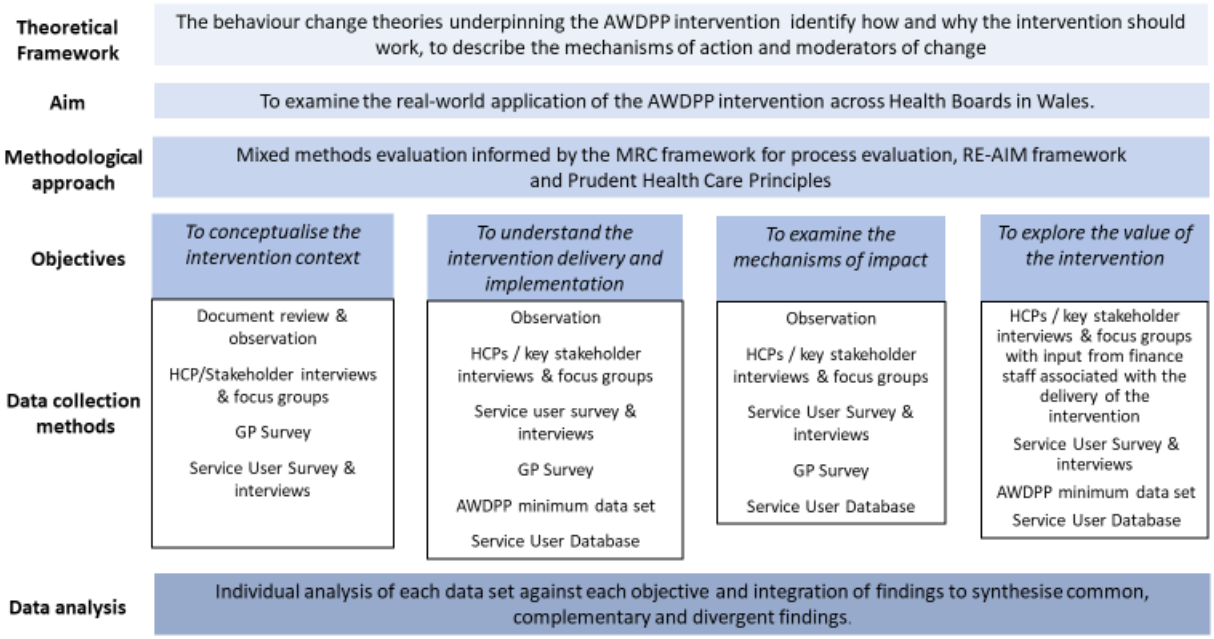
3 Evaluation Setting

The setting was participating primary care clusters across all seven Health Boards in Wales. The process evaluation covered the 14 Welsh Government funded primary care clusters in Wave 1 implementation, with purposive sampling being used to ensure representation from communities across Wales whilst maintaining achievable outcomes within the evaluation period. We did not include primary care clusters that were funded outside of the Welsh Government funded Wave 1 implementation.

4 Study Design

This formative process and value-based evaluation was undertaken to ascertain the views on the AWDPP intervention from service users, health care professionals and key stakeholders. A mixed methods evaluation design was used (Figure 1). Anonymised programme user data was made available by Public Health Wales via the SAIL (Secure Anonymised Information Linkage) Databank [10].

Figure 1: Overview of the AWDPP Formative Process and Value-based Evaluation Design



4.1 Evaluation Approach

The formative process evaluation focused on measures of implementation, including reach, fidelity, adoption, and maintenance of the AWDPP [11], considering the context of evolving local healthcare environments, policies and priorities which may affect the successful implementation of a new model of care / health care promotion [12]. The guidance for process evaluations developed by the Medical Research Council (MRC) was followed [13,14] and was also informed by the Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) Framework [15].

The protocol for this formative process evaluation was approved by a research ethics committee and provided full details of the evaluation procedures.

Within the 14 primary care cluster areas funded by Welsh Government to undertake the AWDPP, there were two target populations for the evaluation:

- *Service Users:* aged 18 and over eligible for, or participating in the AWDPP,
- *Healthcare Professionals:* involved in the development, implementation, delivery, management or support of the AWDPP (e.g., HCSWs, GPs, Practice Managers and other Practice staff, diabetes and dietetic strategic leads).

In brief the following methods of data collection were utilised:

1) document review, plus observation of an AWDPP clinic,
2) individual interviews and/or focus groups with key stakeholders, health care professionals (HCPs) and service users,
3) analysis of the routine data collected via the AWDPP minimum dataset and Service User Database,
4) GP survey

4.2 Ethics/Governance

Ethical approval was obtained from NHS Wales Research Ethics Committee 3 (Reference:22/WA/0159) and all local Health Boards gave the necessary research permissions for the stakeholder and service user focus groups and interviews, questionnaires and clinic observations to take place. All interview and focus group participants gave written informed consent to take part. All evaluation methods were carried out in accordance with relevant guidelines and regulations, and the Declaration of Helsinki.

4.3 Data Collection

4.3.1 Surveys of stakeholders and service users

All GPs within the AWDPP funded cluster areas were invited to complete the GP online survey. The survey consisted of 15 items that measured the process of implementation from the perspectives of professionals directly and indirectly involved in implementing the AWDPP. The survey link was sent directly to each practice manager within the AWDPP funded cluster areas and could be shared with staff who were involved within the practice to allow multiple stakeholders the opportunity to complete and engage with the evaluation. The survey was open for just over 2 months from November 2022 to the start of January 2023. An email reminder was sent to practices that had not responded after 1 month.

Service User Questionnaires were distributed to AWDPP Lead Dietitians during September and October 2022, depending on when R&D permissions were in place for their local Health Board. The Lead Dietitians then gave the questionnaires to HCSWs for distribution to service users. The survey was open for just over 3 months, until the end of December 2022. The questionnaire consisted of 15 items and explored acceptability, accessibility, inclusivity and usefulness of the intervention, along with the reasons for agreeing to take part in the programme, and any facilitators and barriers to participation. The questionnaire was available in English and Welsh and could be completed in either a paper or online format. Service users were handed the paper questionnaire or a flyer giving the link to the online version at the end of face-to-face appointments, by the HCSW. Those who had a telephone or video appointment were sent the link to the online questionnaire via email, or the paper questionnaire after the appointment. A Freepost envelope was provided to those completing the paper questionnaire so that it could be returned directly to the evaluation team. Those who opted to complete the questionnaire online used a link or Quick Response (QR) code to access the questionnaire and submitted it online.

All questionnaires were completed anonymously, however, at the end of the questionnaire, the service user had the opportunity to volunteer to take part in further research by giving their name and contact details. These details were separated from the questionnaire data and stored separately in line with the ethical approval granted to maintain anonymity.

4.3.2 Interviews and/or focus groups with stakeholders and service users

Additional data was collected through one-to-one semi-structured interviews and focus groups with key stakeholders including Lead Dietitians and HCSWs delivering the AWDPP, and national, local Health Board and PHW strategic leads. The data collection took place from September 2022 to January 2023.

Service users who completed a questionnaire and expressed an interest to take part in further research were invited to take part in a focus group or one to one interview. No form of incentive was offered. Sampling was purposive, to include service users from diverse settings with a wide range of circumstances that may influence responsiveness and accessibility to the AWDPP and who have taken part at different time points in the AWDPP implementation. Service users were contacted by one of the researchers to follow up on their expression of interest. Topic guides were used to elucidate narrative data on their experience of the AWDPP, and their perspectives on service user's healthcare use and self-management. Discussions were recorded and transcribed verbatim.

4.3.3 Clinic observations

To assess the fidelity of the intervention to the AWDPP model and any modified local plans, a sample of the face-to-face and telephone/video clinic sessions were observed. One observer sat in on all service user appointments during a pre-arranged clinic session with the permission of the service users and HCSW. An observation checklist, based on the TIDieR framework [16], was completed, and field notes made of any variations to the original programme protocol during the observed clinic and where variations to the programme were observed. These variations were discussed with the HCSW delivering the intervention after the clinic had completed, to better understand the reasons behind it.

4.3.4 Routine clinical and administrative data

During the process of identifying and booking service users for the intervention, a Service User Database was populated by the healthcare professionals delivering the intervention to help them manage the booking process and record uptake of the programme. In addition to basic demographic data, any clinical reason for excluding potentially eligible service users, service user response to the invitation (including reason for decline) and any referral onto support services following the AWDPP appointment, such as weight management services, was recorded. Aggregated, anonymous data from the Service User Database was made available for the evaluation and provided an overview of how many people were going through the programme.

A minimum dataset containing anonymised service user level data such as basic demographic data, some clinical data and variables relating to the delivery of the programme was also analysed. These data were made available for the evaluation by Public Health Wales via the SAIL (Secure Anonymised Information Linkage) Databank [10], however in line with the guidance to use SAIL data, numbers less than 5 could not be reported. This minimum dataset was linked with other health records within SAIL such as the Welsh Index of Multiple Deprivation (WIMD).

Data relating to ethnicity and disability status was not analysed as the data available within SAIL was very incomplete and there were privacy concerns restricting the use of data from the Service User Database. Data regarding BMI and weight were also incomplete with weight available for

around 60% of individuals, however this was due to individuals being able to decline to be weighed.

The AWDPP primary care setting was profiled at a cluster level for demographics, cluster population size, organisational characteristics, and the prevalence and burden of diabetes to understand contextual variation.

4.3.5 Document review

Programme information relating to the context of the AWDPP intervention delivery that may affect the implementation was documented and reviewed, together with results from other evaluation sources (both quantitative and qualitative) to identify and interpret patterns appearing in those data over time and between Health Boards and clusters where feasible.

4.3.6 Value-based health economic assessment

As part of the value-based assessment, a preliminary cost-consequence analysis (CCA) was conducted to understand the short-term economic impact (technical value) of the implementation of the programme [19]. Using information from a preliminary CCA at an early stage estimating the incremental costs and consequences of the AWDPP intervention can enable decision makers to consider the breadth of possible outcomes that are important from their perspective (including short-term activity-based outcomes captured in this evaluation) and enables understanding of the economic value of a complex intervention. Using CCA is a recognised approach to assessing the value for money of a public health intervention and endorsed by the National Institute of Health and Care Excellence [17].

The perspective of the analysis was that of NHS Wales. The time horizon of the analysis available for the analysis was 6 months (June - December 2022). As this time horizon was less than 12 months, costs or outcomes were not discounted in line with best practice [17].

The outcomes estimated for the CCA included: number of people invited to attend an AWDPP session, the number of people attending an AWDPP appointment, the number who booked but did not attend and delivery type (e.g., face-to-face, telephone or video) and whether there was onward referral to other support such as weight management or physical activity. The source of these data was the Service User Database.

In addition to basic demographic data, any reason for excluding potentially eligible patients, patient response to the invitation (including reason for decline) and any referral onto support services following the AWDPP appointment, such as weight management services, was recorded. Aggregated, anonymous data from the Service User Database was made available for the evaluation and provided an overview of how many people were accessing the AWDPP intervention.

The resource use associated with the intervention was costed based on the AWDPP Intervention Protocol developed by Public Health Wales and where there were gaps information from the budget spreadsheet provided by the programme manager was used. Context for the costs was provided by stakeholders, including finance leads, in the Health Boards associated with the intervention and observations in order to provide some granularity and enable a greater understanding of the implementation of the AWDDP programme.

Resource use was valued in pounds sterling (£) using the price year of 2022. Published unit costs (e.g., Personal Social Services Research Unit, NHS reference costs) were used to provide a UK-wide estimation. Where required, local finance records were used. Costs

associated with the delivery of the AWDPP programme were estimated based on resource use and staff time required for training and contact with service users.

4.3.7 Timeline

Delivery of key AWDPP and evaluation milestones are shown in Table 1.

Table 1: Delivery of Key Milestones

	2022												2023		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Delivery milestones															
Development of Protocol and key documents															
Launch of AWDPP Protocol															
AWDPP clinics up and running in the following clusters:															
Caerphilly North															
Blaenau Gwent West															
Anglesey															
Meirionydd															
Central Vale															
City & South (Cardiff)															
Merthyr															
Bridgend West															
North Ceredigion															
South Ceredigion															
Mid Powys															
North Powys															
City (Swansea)															
Upper Valleys (Swansea)															
Evaluation Milestones															
SABU awarded contract															
Development of evaluation protocol and key documents e.g. questionnaires, interview schedules															
Evaluation Protocol agreed with PHW															
Evaluation protocol submitted for NHS Research Ethics Committee review															
NHS Research Ethics Committee approval issued															
R&D permissions & Letters of Access submitted to all LHBs by sponsor															
R&D permission & Letters of Access issued by:															
Aneurin Bevan UHB															
Betsi Cadwaladr UHB															
Cardiff & Vale UHB															
Cwm Taf Morgannwg UHB															
Hywel Dda UHB															
Powys THB															
Swansea Bay UHB															
Data Collection:															
Stakeholder Interviews															
Stakeholder Focus Groups															
Delivery Team Interviews															
Service User Questionnaires distributed									some HBs						
Service User Interviews															
GP Questionnaire															
Clinic Observations															
Data Analysis															
Report															

4.4 Original Sample Size and Selection Strategy

The overall sampling approach was purposive, to ensure engagement from communities across Wales whilst maintaining achievable outcomes within the evaluation period.

Based on information provided by the AWDPP Steering Group, the evaluation protocol made the following assumptions when devising the original sample strategy and calculating the original sample size:

- All 7 local Health Boards would implement the programme across 2 primary care clusters during the evaluation timeframe.
- Each local Health Board would employ 1 HCSW per primary care cluster to deliver the programme.
- Each HCSW would run 200 clinics within the first year of the programme. Allowing for the evaluation timeframe, data collection would take place in clinics throughout June to November, therefore approximately 80-90 clinics were expected to have taken place per primary care cluster.
- A maximum of 7 appointments would take place per clinic session resulting in approximately 560 to 630 people attending an appointment per primary care cluster, throughout the evaluation period.

At the time of writing the evaluation protocol (May 2022), it was estimated that there were 92 General Practices in the 14 primary care clusters selected for the AWDPP roll-out.

All service users eligible for, or participating in, the programme during the data collection period were able to be involved in the evaluation via the Service User Survey. They were all also able to volunteer for the additional research i.e., focus groups and individual interviews. Purposive sampling was due to be used to select those invited to take part in the additional research, but due to the reduced timeframe due to the unforeseen time needed for programme set up in some Health Boards, all those who volunteered within the data collection period were contacted and invited to take part in either a focus group or interview.

All GP practices in the relevant primary care cluster areas were invited to be involved in the evaluation via the GP Survey. All HCSWs and all local dietetic leads managing the programme were also invited to take part in the evaluation either via an individual interview or focus group. Purposive sampling was used to identify the programme key stakeholders who were invited for interview.

4.4.1 Final sample size

Based on the original assumptions, approximately 674 individuals were anticipated to take part in the evaluation. However, the actual number of people who participated was far fewer (Table 2) at the end of the agreed recruitment period for the evaluation.

Table 2: Participant sampling matrix. Planned and actual participation for each mode of data collection throughout the evaluation.

Participant category		Data collection method							
		Observation		Interviews		Focus groups		Survey	
		Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Service Users		~50 to 70	5	~10	8	42	0	~400	116
*HCPs	**HCSWs	~10	1	14	10	0	0	0	0
	***Key stakeholders	0	0	14	13	42	9	~92	25

~ approximately

* Healthcare Professionals

** Healthcare Support Workers involved in delivering the programme

*** Key stakeholders such as GP Practice staff, national and Health Board strategic leads (dietetics, diabetes, Primary Care), national and local programme implementation and delivery leads (PHW Programme delivery team, local lead dietitians).

Participation in the evaluation varied across Health Board area, with some of the early adopters being able to engage more with the qualitative data collection, as Table 3 demonstrates.

Table 3: Participation in the qualitative data collection by organisation.

	Stakeholders		HCSW	Service Users		GP	Clinic	
	Interviews	Focus Group	Interviews	Interviews	Survey	Survey	Observations	*Total*
Aneurin Bevan UHB	2	1	2	3	20	3	0	**31**
Betsi Cadwaladr UHB	0	1	0	2	14	4	0	**21**
Cardiff & Vale UHB	1	3	2	2	35	3	6	**52**
Cwm Taf Morgannwg UHB	0	1	0	0	7	0	0	**8**
Hywel Dda UHB	2	1	2	0	0	1	0	**6**
Powys THB	0	1	2	0	18	4	0	**25**
Swansea Bay UHB	0	1	2	1	16	5	0	**25**
Public Health Wales	5	0	0	0	0	0	0	**5**
National Strategic Lead	3	0	0	0	0	0	0	**3**
Anonymous	0	0	0	0	6	5	0	**11**
Total	**13**	**9**	**10**	**8**	**116**	**25**	**6**	**187**

Note: Clinic observations includes 5 service users and 1 HCSW.

4.4.2 Limitations of the sample size

There are several reasons for the reduced sample size:

1. There were delays in the start-up of the clinics and not all Health Boards were able to establish or maintain AWDPP clinics within the evaluation period. One Health Board did not start to run clinics until January 2023 as they planned to implement a more ambitious and complex programme Health Board wide, and three other Health Boards had to either pause or reduce the number of clinics due to staff shortages. This significantly reduced the number of people using the service compared to that anticipated and affected the number of people able to take part in the survey and subsequently volunteer for the additional research (interviews and focus groups). We are unable to calculate the exact response rate for the Service User Survey as we do not know how many people attended appointments and were given the questionnaire during the data collection period. However, we know 278 people attended the programme before the end of September (SAIL data), so assume the remainder attended between October and December, when the majority of the questionnaires were being distributed. Using these assumptions, we estimate the response rate to the service user questionnaire to be approximately 22%, which is much higher than the 5% response anticipated in our original plan.
2. Not all HCSWs were in post during the evaluation period as there was unforeseen time needed for recruitment of staff in some areas. There was also some staff turnover during the evaluation period. HCSW interviews took place during October and November 2022 whilst there were two HCSW vacancies and three HCSWs were working their notice period. One HCSW who was leaving their post agreed to be interviewed for the evaluation but the other HCSWs did not respond to the invitations sent. The vacancies and staff turnover were across three Health Boards and as a result we were unable to gather any HCSW feedback from two Health Boards.
3. Delays in HCSWs being appointed in some areas combined with the short timeframe for the evaluation also impacted the number of AWDPP clinics that could be observed. The observed clinics were rescheduled to take place during November and December 2022 and whilst two local Dietetic Leads originally agreed for a clinic to be observed in their area, only one was arranged within the timeframe available. The primary care cluster where the observed clinic took place was an early adopter of the AWDPP and the HCSW had been in post and working independently longer than those in other areas. Other HCSWs were either not working independently during the time the observed clinics were taking place or declined to be observed.
4. Stakeholder engagement at Health Board level was lower than expected. The majority of Health Boards held regular local implementation groups and the expectation was to engage with these stakeholders for the local focus groups. However, the implementation groups contained quite a few local delivery team members and PHW staff and after excluding key stakeholders who were already being invited to take part in the evaluation via stakeholder interviews, there were very few Health Board areas where there were enough other stakeholders to make holding a focus group practical or appropriate to run. Arrangements went ahead in one Health Board area but the majority of those invited were unable to attend the date and it was too late within the data collection timeframe to arrange an alternative date. The focus group went ahead with a smaller number of participants. However, this gave capacity for a focus group to take place with all the local Lead Dietitians, which was additional to the original plan.
5. Seven local service user focus groups were originally scheduled to take place between September and November 2022. However, due to the staggered start of the clinics and reduced data collection period, a reduced number of service user focus groups were planned. Three Wales wide virtual focus groups were planned to take place in December 2022, one

during the morning, one in the afternoon and one in the evening, however the majority of people who responded to the invitation were unable to make the dates. The focus groups were unable to be rearranged due to the evaluation timeframe. One person did accept the invitation to attend a focus group and took part in an individual interview instead.

6. The participation of general practices in the evaluation was lower than planned, however, the number is representative of those who have engaged with the AWDPP delivery so far. At the end of December 2022, 29 practices had worked with the delivery team to identify potentially eligible patients from their practice to take part in the programme. Twenty-five practices took part in the GP Survey. Some practices chose to take part anonymously but where there was a low response rate to the survey, there was also a lower number of practices running the programme during the evaluation period.

4.5 Data Analysis

Analysis of quantitative data was primarily descriptive utilising mean, 95% confidence intervals, and percentages as appropriate. Statistical comparisons were limited due to differences in timelines and how the programme has been implemented across Health Boards.

Analysis of qualitative data was largely inductive, drawing on the principles of thematic analysis [18]. Inductive themes were identified through examination and comparison, tabulation and mapping.

The EuroQol 5 Dimensions questionnaire (EQ-5D-5L) was used to collect Health Related Quality of Life (HRQOL) data. Descriptive values consisting of five dimensions (mobility, self-care, usual activities, pain & discomfort, anxiety & depression) were converted to utility values (EQ-5D Utility). Utility is typically valued between 0 and 1 where 1 represents full health; values below zero represent health states considered worse than death, The respondent was also asked to complete a visual analogue scale to assign a single value to their health state at the time of completion (EQ-5D VAS). EQ-5D VAS is valued between 0 and 100 with higher scores representative of higher quality of life. Quality-adjusted life years were unable to be calculated as this evaluation did not cover any follow up appointments and therefore only one utility observation was available for each individual.

4.5.1 Data synthesis or integration

Our mixed methods evaluation has been based on implementing our quantitative and qualitative methods of data collection during the same timeframe and with equal weight placed on the findings derived from these sources. Our approach broadly fits under the typology of triangulation [19] where different data collection methods (as summarised in Figure 1) are utilised [20, 21].

For our analysis, we first analysed the data from each of our datasets and reported their separate results (e.g., survey). The evaluation team held weekly meetings throughout the evaluation period, in which emerging results were reported. We then brought these results together in the next stage of analysis and interpretation by integrating the data together against each of the objectives during the analysis and writing up stage (February-April 2023). This activity was undertaken as part of several evaluation team meetings (each typically half day) to discuss and agree our emerging findings, including meetings with our public contributors. Our focus was integrating the findings to examine commonalities (e.g., where the results from each respective dataset were similar in explanation); complimentary findings (e.g., where the results from our qualitative data added to or supplied more in-depth explanation from our quantitative data) and divergence (e.g., where our findings from one dataset were contradictory or deviant to the results from another on the same phenomenon of interest).

4.5.2 Presentation of our findings

During our final stage of integration, we looked to remove duplicated data wherever possible in reporting our findings against each objective. In agreement with our public contributors, we present the verbatim quotes in sufficient detail to represent a rich description whilst taking a judicious approach to truncating the transcript excerpt selected for ease of reading. However, given the overlap across our questions, we have deliberately chosen (where necessary) to retain the same data (e.g., interviewee quotes) which enabled us to explain our findings or to provide clear cross-reference to previous findings reported.

To maintain anonymity, we have labelled our data from our qualitative interviews as HCP (for all participants in a professional role e.g., AWDPP team or GP staff) or service user. This has been undertaken because the limited number of participants across professional role groups, Health Boards and service users could result in the potential attribution of quotes to individuals.

4.5.3 Rigour

In Table 4, we set out how we considered rigour within the context of this mixed methods evaluation. We took a pragmatic approach to reporting this under headings applicable to both qualitative and quantitative components given the lack of consensus in the literature on reporting rigour in mixed methods research [22].

Table 4: Considerations of rigour employed during the design, conduct and analysis of the AWDPP formative process evaluation.

Qualitative	Quantitative	Actions taken
Dependability	Reliability	• Development of an evaluation protocol reviewed by the AWDPP team and our public contributors. • Data checks on the Service User Database and survey data obtained e.g., missing, duplicated data. • Conduct of analysis in Excel to provide a transparent and testable approach to our quantitative analysis. • Audit trail of our research e.g., meeting notes, observation fieldworks, interview transcripts and coding/analysis in a share-point folder with weekly internal SABU meetings to act as a rolling peer audit of the evaluation process. • Meetings with our public contributors at key milestones to test and challenge our data collection approaches, emerging findings, and frame the discussion and considerations.
Credibility	Internal Validity	• Rapid literature review and discussions with the AWDPP team and public contributors to develop the content of the GP Practice and Service User Survey (Face and Content validity). • Using SAIL database which employs stringent data quality checks on routine data. • Data cleaning and data checks (e.g., extreme variables, missing data) on the Service User Database and survey.

		• Development of our data collection and analysis framework following RE-AIM, MRC framework for complex interventions. • Member validation of our findings with our public contributors. • Triangulation of our data with equal weight placed on quantitative and qualitative findings.
Transferability	External Validity	• Our sampling followed the same populations involved in the AWDPP programme during the evaluation period to maximise representativeness. • Using triangulation of our data and use of direct quotes from respondents across stakeholders and beneficiaries of the AWDPP to present rich descriptions of our findings.
Confirmability	Objectivity	• Production of an evaluation protocol and reporting our evaluation progress including challenges as part of monthly meetings with the AWDPP team. • Review of our draft findings and report with our public contributors and AWDPP team with appropriate feedback (e.g., to ensure accuracy) accommodated into a second revised iteration and further round of feedback to produce our final report.

5 Findings

Placing the findings in the context of a post-Covid NHS, NHS recruitment systems and understanding the context and constraints of the Wave 1 roll-out of the AWDPP is crucial. Whilst we can learn from the process evaluation, the very fact that this was a new programme means that there is a 'learning curve' and implementation hurdles and barriers that may never occur again. We need to report these but also identify those issues that may repeat or compound problems themselves if not addressed. We are also constrained by the quantitative data available (from all sources) in what turned out to be a short time period, so some issues or aspects of the roll-out might not be identified at this stage.

5.1. Key Implementation Milestones

By the end of December 2022, AWDPP clinics had started to be delivered in 11 of the 14 funded primary care clusters. During this period, 29 GP Practices had been involved in the programme by identifying people at risk of T2DM from their practice lists, and therefore potentially eligible for the programme.

Table 5 illustrates the key implementation milestones, presented by primary care cluster and Heath Board. It describes the programme set up timeline, engagement of GP Practices and future programme plans within each area. Three primary care clusters had not begun clinics during the evaluation period. These included the two primary care clusters in Hywel Dda UHB and one cluster in Betsi Cadwaladr UHB. Staffing was the reason the cluster in Betsi Cadwaladr UHB were unable to begin clinics as they, along with four other Health Boards, experienced staff turnover within the evaluation period. A total of five HCSWs left their positions in the programme within the first eight months and at the end of December 2022, there were three HCSW vacancies across the programme. In areas where HCSWs left their post, some cover was provided by the local Lead Dietitian or another HCSW, however, clinics were paused or reduced in four of the primary care cluster areas while a replacement was recruited. A summary of the primary care cluster demographics and profiles (including Diabetes Prevention activities already being delivered) compiled by SABU from information provided by the AWDPP team is available on request.

Table 5: Key Implementation Milestones presented by Primary Care Cluster

Milestone	Aneurin Bevan UHB		Betsi Cadwaladr UHB		Cardiff and Vale UHB		Cwm Taf Morgannwg UHB		Hywel Dda UHB		Powys THB		Swansea Bay UHB	
	Blaenau Gwent West	Caerphilly North	Anglesey	Meirionnydd	Central Vale	City & Cardiff South	Bridgend West	Merthyr	North Ceredigion	South Ceredigion	North Powys	Mid Powys	City Health	Upper Valleys
Lead Dietitian in post	31/3/22 (0.5 FTE)		31/3/22 (0.5 FTE)		4/4/22 (0.8 FTE)		1/6/22 (0.5 FTE)		13/6/22 (1.0 FTE)		1/8/22 (0.5 FTE)		11/7/22 (1.0 FTE)	
HCSW* in post	18/7/22	3/5/22 to 31/12/22	18/7/22 to 30/11/22	1/5/22 to 1/7/22; 14/12/22	23/5/22	26/9/22	28/11/22	12/9/22 to 11/11/22	3/10/22	3/10/22	1/8/22	1/8/22 to 19/12/22; 5/12/22	11/7/22	11/7/22
1st clinic start date	31/10/22	4/7/22	1/8/22	tbc	19/7/22	8/11/22	28/10/22	1/10/22	16/1/23 (planned)	9/1/23 (planned)	9/11/22	5/10/22	9/9/22	27/9/22
No. of Practices in cluster	5	8	10	6	7	6	3	7	7	5	7	5	8	4
No. of Practices 'hosting' AWDPP clinics	2	2	2	0	6	2	1	1	0	0	2	3	5	3
Future plans for AWDPP funded implementation	Additional practice to start clinics in January 23	New HCSW to be appointed in January 23	To run clinics in local community hospital	To run clinics in local community hospital	To run clinic in remain-ing practice	To run clinics in remaining 4 practices	2 additional clinics per week due to take place in community venues from Jan onwards	HCSW interview taking place Jan 23	Clinics to take place in community venues with longer appointment times per patient (additional 15 minutes)		Appoint-ments taking place in Newtown Hospital and plan to use Machyn-lleth Hospital as well.	Patients from 3 practices being seen in 1 practice due to lack of space.	Discussio ns with other practices ongoing.	Plan to get remaining practice up and running by end of Jan.
Future plans across local Health Board	No current plans to roll-out across other clusters		No current plans to roll-out across other clusters		South East cluster running clinics since April 22. Plan to roll-out across 2 further clusters.		Plan to roll-out programme to rest of Health Board with additional dietetic support.		Programme planned to run Health Board wide with larger dietetic team and support in place.		Plan to roll-out to remaining cluster in Health Board.		Penderi cluster running clinics since Sept. 22. Plan to roll-out across rest of Health Board with additional dietetic support.	

Notes: All data as of beginning of January 2023; Where exact date within the month is unknown, the 1st of the month has been used;

*HCSW refers to Health Care Support Workers, Health and Wellbeing Facilitators or Dietetic Support Workers

5.2 Understanding the Intervention in Context

5.2.1 Current diabetes prevention programmes in Wales

In Wales initial piloting of pre-diabetes pathways took place within two separate primary care clusters (PCCs), Afan Valley and North Ceredigion [5], and these early initiatives have been used to inform the design and development of the AWDPP [8]. However, there was some initial scepticism from HCPs about the AWDPP development and implementation who were not fully convinced by the evidence of the pilot:

"Because the reality is one brief intervention, interaction, to change a behaviour, which is significant enough to get weight loss and a lowering of HbA1c … doesn't make any sense. From a behavioural science perspective, … that's not the expected outcome from one brief intervention, in terms of something as tricky as managing your weight. So by itself, without the referral services, I would expect to see … limited effect, if I'm honest." [HCP]

"I'm not expecting to see the same level of effect as is demonstrated in [pilot sites] ... I'm not expecting to see that at national rollout level. But actually we just need to see a small reduction in HbA1c to have a population level effect." [HCP]

The perceived synergy between diabetes prevention activity and weight management approaches were reported as influencing the development of diabetes prevention in Wales; specifically, that efforts should be understood in the context of the wider All Wales Weight Management Pathway (AWWMP) [23], which was reported as "*similarly focusing on individualised obesity prevention initiatives*".

It is important to recognise that due to such synergy, untangling the AWDPP impact may be challenging if service users are invited to different programmes. For example, in the AWDPP 'Moving from Design towards Implementation' report [24] it is recognised that:

"The context of local provision is evolving in Wales following the recent publication of the All Wales Weight Management Pathway (AWWMP) 2021 and the subsequent developments happening to support implementation of the AWWMP. Through a person-centred lens, it was recognised that many patients receiving the brief diabetes prevention intervention in the pilots will therefore ultimately receive a complex package of interventions depending on their body mass index and availability of services locally."

This is further recognised in the AWDPP Equity assessment [25]:

"There is a range of existing brief lifestyle interventions to support people with glycated haemoglobin levels in the pre-diabetic range across Wales as identified through a mapping of Cluster plans. This means there is considerable variation in the context of intervention delivery that may make it particularly challenging to isolate the specific intervention effect of the AWDPP."

Whilst cognisant of the AWWMP, no targeting of related behaviour change activities or weight management interventions have so far been reported on in relation to the AWDPP delivery. However, PHW undertook a scoping exercise during the AWDPP development to consider the primary care context of current T2DM preventative work across Wales to provide a baseline assessment of the levels and content of prevention activity across primary care clusters in NHS Wales Health Boards.

Two documents specifically report on this activity, the Cluster Plan Analysis [26] and Dietetic Lead Scoping Activity [27]. The initial analysis of cluster Integrated Medium Term Plan (IMTP) / delivery plans identified 19 clusters that had or were doing something related to T2DM prevention although details of activities were found to warrant further investigation. A further 19 clusters were found to offer health behaviour interventions to improve general health, and these clusters were identified as potentially being capable of supporting the national programme in terms of resources, given the opportunity to adapt their offer to fit with the pre-diabetes intervention model. The second report additionally drew on the knowledge of dietetic leads in each of the seven Health Boards in Wales. The collated responses gathered from the IMTP / delivery plans, dietetic lead scoping activity found that there was a lot of variation in diabetes prevention work across the Health Boards, with some GPs not delivering any support or identifying those at risk. There was also no specific funding for diabetes prevention.

These activities were also reflected on in interviews by stakeholders from our evaluation:

"As part of the initial work, we did a baseline assessment of diabetes prevention activity in Wales. What that showed was that it was a very mixed picture. So there were some areas where there was very little diabetes prevention activity, there were others where there was quite a lot going on, in one form or another. And where there was diabetes prevention activity happening, in some places it was a very different model" [HCP]

While the T2DM prevention landscape was found to vary greatly by Health Board, the scoping exercise concluded that the primary care clusters were motivated to introduce preventive measures to reduce the increasing prevalence of T2DM. Further evidence of capability to support a systematic national approach to T2DM prevention were perceived on the basis that there was some consistency across the current efforts as to the target population, advice offered during interventions and the signposting options available to service users.

Time and effort were subsequently spent developing a national protocol, with a task & finish group established to complete the work, developing an approach that could be consistently delivered across primary care clusters in Wales. The meetings were described as not always "*comfortable"* with some "*fair and frank discussions"*, particularly around the inclusion / exclusion criteria for the programme, and there was an acceptance that the programme may have to be tailored for groups to ensure an equitable approach.

"You've got to have thresholds, because you need to be really clear at a policy level about who's eligible for the programme and who isn't, because otherwise you're in danger of wasting resources because you put people through the service who aren't going to benefit from it or aren't going to benefit a lot from it, or who may be harmed by it." [HCP]

"I think the approach that we took was really good, and I think we did take it back to first public health principles, so we did have a logic model, we did have a theory of change, ….we used a TiDieR framework in thinking about the evaluation, that kind of … making sure that it would be … somebody would be able to replicate so that going forward we had some solid groundings." [HCP]

Whilst there was evidence of motivation, capability, and opportunity for rolling out a national programme, it was acknowledged that this would take time. However, expectations by key stakeholders were raised when Welsh Government announced the AWDPP funding. Reflecting on the impact this had on the design and development phase, it was felt by stakeholders that from the announcement expectations had been difficult to manage, particularly within local Health Boards. The subsequent pace expected for the national implementation may have limited some opportunities to fully understand local contexts.

"Well the announcement came before we really started… in retrospect it would have been great to have had an announcement of funding that didn't start straight away." [HCP]

In practice some duplication of services was reported by the AWDPP delivery team during our stakeholder interviews, especially in one Health Board; this was reported as confusing for the service users who would decline appointments thinking they had already attended the AWDPP. The strategy adopted was to develop communication and raise awareness of the role of the AWDPP intervention to manage potential duplication.

"The only thing with surgeries is that we've had problems where the surgeries are holding their own prevention clinics for diabetes and so we have to kind of work out with them that we can kind of take on these patients now and how best to kind of communicate that with them in terms of making sure that we're not duplicating it". [HCP]

5.2.2 AWDPP site selection and roll-out

The funding for the AWDPP came through the Healthy Weight, Healthy Wales programme in Welsh Government. There was initially some discussion within PHW as to which team was best placed to implement the programme with the Primary Care Division given the lead. This was thought to have created some initial tension for the delivery team and so an internal steering group was established to oversee the delivery of the AWDPP programme.

"So there was … already tension there, which is why we needed an internal steering group, so it was uncomfortable to start off with" [HCP]

The development of the AWDPP comprised of four workstreams (Intervention Design, Stakeholder Engagement, Delivery and Evaluation) overseen by an Implementation Board. The membership of each group was multidisciplinary and comprised of representatives from primary and secondary care in each local health board, national strategic leads for relevant specialties, PHW and members of the voluntary sector. Regular meetings allowed for expert input into the design and development of the AWDPP programme, however, meeting burden in the protocol development stage of the programme was highlighted by several stakeholders.

"When I first joined it, it was like, oh my goodness there are meetings and meetings and meetings" [HCP]

"It was quite intense as the initial all-Wales project was being set up and designed, with quite a big commitment for meeting time particularly, … it became a bit too much for me and I had to step back a little bit just because of my time commitment, but it's less so now that it's up and running. [HCP]

Whilst challenging for some, the regular workstream meetings ensured that the momentum that was needed for the project to deliver was maintained and the working groups worked at pace with the support of the PHW team.

"It's good to create pace and momentum, and actually I think [X] did a fantastic job of that, I really do, … we were exhausted for about ten months, … for all of the angst about it, [X] is very good at creating momentum" [HCP]

"But the kind of timing and the funding I think was … a real barrier rather than an enabler, and I think we've … been forced into making decisions which I think we might not have made, had we not had that time pressure. I think there are things that would have been more sensitively handled and caused less angst, for example in the referral services, had we had a bit more of a run-in time I suppose" [HCP]

5.2.2.1 Site selection

The two primary care clusters selected from each Health Board involved in Wave 1 were identified based on:

- whether there is a high prevalence of type 2 diabetes in their area,
- whether there is a clear population health need,
- their readiness to deliver the programme.

Site selection was reported in *Moving from Design towards Implementation* (2021) [24] as multifaceted:

> *"Decisions on the initial Clusters for inclusion are based on a combination of factors, mainly the Cluster population health need (e.g., prevalence of diabetes and levels of socio-economic deprivation) and PCC readiness.*
>
> *Cluster readiness is determined firstly by an interest in the AWDPP or established Cluster work on diabetes prevention / health behaviour interventions, and secondly a commitment to deliver the AWDPP with fidelity to the intervention and evaluation design, including collection of the minimum data set and access to patients and staff for participation in the qualitative component of the process evaluation."*

Following initial discussions with Health Boards, a Confirmation Letter was issued to all Health Boards setting out the intention to award a grant to provide assurance in support of the recruitment process. This was followed by the award of the formal grant offers to Health Boards for initial implementation of the AWDPP up to March 2024.

Extensive work has been carried out by the AWDPP workstreams to identify and consider issues around equity and access. This understanding of the demographic profile of the clusters is important for designing, implementing, and evaluating effective diabetes prevention and management initiatives that are tailored to the needs of the local population.

5.2.2.2 Roll-out

Commencement of the Implementation Phase of the Programme was planned for March 2022. As shown in Table 5 (Section 5.1), there were variation in the implementation milestones across each of the Health Boards including the recruitment of the Lead Dietitian and HCSW staff at Health Board Level which were key steps to delivering the AWDPP.

The three Health Boards (Aneurin Bevan, Betsi Cadwaladr and Cardiff and Vale University Health Boards) first to deliver the AWDPP all had Lead Dietitians in place by early April 2022. Lead Dietitian posts to support AWDPP were 0.5 Full Time Equivalent (FTE) in Aneurin Bevan and Betsi Cadwaladr University Health Boards and 0.8 FTE in Cardiff and Vale University Health Board. Cardiff and Vale University Health Board supported the additional hours for the post through funding outside of the AWDPP core funding to allow capacity for the Lead Dietitian to deliver the programme in an additional primary care cluster. This additional cluster piloted many of the AWDPP processes. All three Heath Boards had their first HCSW in post during May 2022, however the HCSW appointed in Betsi Cadwaladr University Health Board left the post within the first few months, delaying the start of clinics in the area. Aneurin Bevan and Cardiff and Vale University Health Boards had the first AWDPP clinic in one cluster up and running by early and late July respectively. Betsi Cadwaladr University Health Board had their first clinic up and running in one cluster in August 2022.

NHS recruitment processes took slightly longer in Swansea Bay University and Powys Teaching Health Boards and resulted in the Lead Dietitians and HCSWs commencing their roles at the same time in July and August 2022 respectively. The Lead Dietitian post in Powys was 0.5 FTE, whereas in Swansea Bay it was 1.0 FTE. As with Cardiff & Vale UHB, the Swansea Bay Lead Dietitian was responsible for delivering the programme across a wider area than the two AWDPP funded primary care clusters, as Swansea Bay planned to deliver the programme across the whole Health Board.

The simultaneous timing of recruitment to the Lead Dietitian and HCSW roles were discussed by some stakeholders and not felt to be helpful for either the Lead Dietitian or HCSWs:

"Looking back … why would you have support workers starting before a lead role, when the lead role was to support and train" [HCP]

Despite the later start, the first clinics at Swansea Bay University and Powys Teaching Health Boards were up and running within two months of the Lead Dietitian and HCSWs taking up their roles. Recruitment issues also played a part in the clinic set up timeline for the programmes in Cwm Taf Morgannwg and Hywel Dda University Health Boards. Both Health Boards had a Lead Dietitian in place in June 2022, with the HCSW in Cwm Taf Morgannwg in post in September 2022. As was the case in Betsi Cadwaladr, the HCSW in Cwm Taf Morgannwg University Health Board left their post within 2 months and clinics were run by the Lead Dietitian until an additional HCSW took up post in October 2022 and was able to work independently.

Roll-out of the programme in Hywel Dda University Health Board was slightly different to the other Health Boards as Hywel Dda were already in the process of implementing a Health Board wide diabetes prevention programme prior to the AWDPP roll-out and have continued with their plans whist still engaging with the national roll-out. There are some differences in the approach they took, and NHS recruitment processes caused delays. As a result, implementation of their programme has taken longer than in other Health Boards. Clinics were due to start in January 2023, which is outside of the data collection timeframe for this process evaluation. Some of the key differences in their programme are the appointment of Band 4 Health and Wellbeing Facilitators rather than Band 3 Healthcare Support Workers, 15 minutes additional appointment time and the provision of 'Foodwise for Life' group sessions delivered by the AWDPP team as follow on support. These enhancements to the national protocol will increase the cost of the intervention in Hywel Dda and whether it makes their programme more effective or more cost effective than the national programmes should be assessed.

5.2.2.3 Recruitment and roles

A consistent theme throughout our process evaluation has been the recruitment and retention of staff, in particular Healthcare Support Workers (HCSWs). In addition, the part time nature of the Lead Dietitians role was also brought up by some HCSWs. Recruitment of staff was raised as an issue in terms of the length of time the Human Resources process took in some Health Boards, but there were also reported difficulties appointing the right people to the advertised posts, and the need to advertise a number of times before a suitable candidate could be appointed.

"I think I interviewed in April, but I didn't actually start till August, … I think I was the first one to be recruited, so they hadn't actually recruited a dietitian … so it took a bit of a while to get it up and running, …." [HCP]

"The pressure felt from [x] at the start to get people in post has led to us recruiting just who was available and not necessarily the right people for the roles, which inevitably has led to ...them leaving and at this point having to restart everything again" [HCP]

The stakeholder interviews further reflected on the delays:

"I don't think we had a single reason why there was a delay in recruitment necessarily, I think that we know that there were different unique circumstances happening in all of the Health Boards that kind of contributed…" [HCP]

"I think some Health Boards were more proactive and enthused to … to take forward the work at pace, some perhaps had more capacity, more people involved that they could work with, and others were you know sort of more of a one-man band, so I think it varied…." [HCP]

With regards the 'Healthcare Support Worker' role, there has been inconsistency in the name of the role, role description, banding and contract type across the Health Boards, with one Health Board being an 'outlier' and treating the post differently to all the others. They appointed Band 4 (NHS Agenda for Change pay scales) 'Health and Wellbeing Co-ordinators' rather than Band 3 'Healthcare Support workers' or 'Dietetic Assistants', and have reported no problems recruiting to these vacancies, other than navigating Human Resources processes.

"...one of the other problems is that we've gone with the health and wellbeing facilitator, who's a Band 4 role, and the All Wales have gone with a Band 3 healthcare support worker role. But we felt that we couldn't do that because I already have self-management facilitators… in who are Band 4s, and they would be delivering exactly the same" [HCP]

Other Health Board areas reported difficulties arising from the job title and job description, for example, newly appointed staff having to undertake mandatory training for HCSWs that was not relevant for the AWDPP role. Most Health Boards also offered the posts on a fixed term basis, in line with the funding they were due to receive. This was also perceived by most stakeholders as being a barrier to people applying for the posts, and whilst the HCSWs interviewed for the evaluation did not see the fixed term aspect as a barrier, this may reflect a self-selection bias where others who perceived this as a barrier simply did not apply.

"I don't know how [that] would affect other people, I wasn't really dismayed by the fact it was a fixed term post because I didn't imagine it would be a permanent role for me anyway, and I was aware … like the programme itself isn't even going to run for more than two years currently..." [HCP]

There were differing views amongst the stakeholders regarding the banding of the HCSW role with more senior and central implementation stakeholders generally feeling the Band 3 was a true reflection of the role.

"It probably is a Band 3, I'd love it if it was a Band 4, because … we could ask them to do a little bit more, one of the barriers I suppose is that … those of us who have been designing this are a long way from being a Band 3 … we're a long way from actually thinking, well who is it who would come into a Band 3 post? And have they got any experience in talking to people about behaviours?" [HCP]

However, due to the level of independent working, liaison with primary care staff and advising service users on self-management, other stakeholders felt a Band 4 more accurately reflected the role. Whilst the fixed term nature of the role was not seen by those who were interviewed as an issue, all the HCSWs interviewed and employed as Band 3 agreed the role was more extensive than expected with more responsibility and independence than usual for a Band 3 and should be set at Band 4.

"I did bring this up I think when I first started, I've worked in a role as a Band 3, but it's very much a supervised role, you know … although I was seeing patients on my own, in my own clinics, you know yeah, it's difficult … maybe in time … they'll look at things and they'll see that we are you know lone workers almost … because we will be going to …sites and we will be seeing sessions of patients and … it's a lot, you know signposting them. …. this is very much you're giving advice. You know almost educating…it's quite involved… we're doing an awful lot! We've literally got the service up and running…" [HCP]

There was consensus that the banding of the role was causing HCSW retention issues and would continue to do so whilst it remained a Band 3.

"The difficulty with this role is Band 3 levels within the NHS are normally stepping stones." [HCP]

"…you're then giving them a reasonably good amount of training, and then there's other job opportunities at a higher grade… there's going to be quite constant movement with the people that are out there on the ground." [HCP]

Five HCSWs left their posts during the evaluation period (Table 5). Interviews were only captured with one of the leavers who noted that whilst the AWDPP role was exciting and enjoyable, the new opportunity they were leaving for was a Band 4 and the tasks were not dissimilar to the AWDPP HCSW role. The reason for leaving for the other HCSWs is unknown to the evaluation team.

"You know because like I said, I did enjoy the programme, you know and I do enjoy having that patient contact, it's good that you know you can have that patient contact as a Band 3. But working with this programme now, [in new post not AWDPP] you know, we're doing very similar things as them [the Band 3's in AWDPP], you know seeing patients, booking them in, doing all those stuff, it's just obviously there must have been some sort of agreement that they would be Band 3's you know at least to start with." [HCP]

Recruitment of Band 3 HCSWs has been time consuming in most of the Health Board areas so regular turnover, in small teams with no cross cover, had and will continue to directly impact the delivery of the programme unless addressed effectively. There was a perception that if there had been more time at the beginning to provide clarity and gain consensus on the role, things could have been different.

"...we needed them [Health Boards] to be lining up their recruitment before we actually had the intervention design nailed" [HCP]

"So the whole timescale really could have been stretched just a little bit to make it more comfortable I think for Health Boards to know what they needed to go out and recruit... So I think the timescale really has been problematic" [HCP]

Health Boards that had already taken the decision to extend the AWDPP to other primary care clusters within their area were perceived as having a more robust workforce model as they had cover for absences and additional internal support with a larger team.

"I think that in Health Boards where they've gone Health Board wide, I think we're seeing that they have more resource and that's potentially leading to a more resilient model from a workforce point of view." [HCP]

Many of the Lead Dietitians and HCSWs also noted that the Lead Dietitian role should be a full-time post where this was not so, especially in the initial start-up phase to support the newly

appointed HCSWs with relationship/network building with the GPs and learning the GP systems. Having Lead Dietitians spread across two roles was found to cause delays as HCSWs reported waiting for information and approvals and actions to be undertaken by the local Lead Dietitian – e.g., GP contacts, triage of escalated cases and general supervision. Some Lead Dietitians who were part time were reported as going over their allocated role time to support the programme.

"A lot of stuff maybe you should have manager support from just hasn't been there. Potentially because well she's only [x] days and if [x] wants to focus on ...other things as well … and it just seems like attending meetings for other things just seems to like cut into the time more and more and more. …because like with our escalation clinics, sometimes there'll be … I'll just try and phone some of the people you can't see or book them in … or everything's sort of changing every day." [HCP]

"[LD] pretty much been working full-time on our project, even though her role is meant to be [x] days a week, and I think that's just something that she's been able to do because her other role has been able to be postponed... But yeah, so I think that's definitely something that she's given us a lot of support. And she also had one day off a week, and I think given some of the issues that we've had, and we just don't book clinics on that day because we might need her for lots of different reasons, so it's good that we've had that support really. [Periods of absence] really slowed things down as well, because obviously we only have that really small team, within a much busier wider team, so I think that was something else where it's not easy to really kind of work effectively with so few people…." [HCP]

5.2.2.4 Systems and training

Accessing patient level data so that the HCSW and / or the Lead Dietitian could identify, assess, approach, and then complete the patient medical notes in the practice was a key task to allow clinic set up.

Reflecting on arranging access to GP systems and data sharing agreements, stakeholders noted that this had been a time consuming and stressful issue to resolve for many of the Lead Dietitians. Individual General Practices often approached these agreements differently.

"Obviously the IG [Information Governance] stuff, we've come up with discrepancies in different Health Boards, so we aimed to put the DPIAs [Data Protection Impact Assessment] and the IG in place from a central point, so that each of the Health Boards didn't have to go off and write their own, because we know how big a document they are" [HCP]

"Because I think … maybe the gaps were more like the how do you use the DPIA? You know that IG stuff? I know a lot of the leads really struggled with who do I need to take this to specifically?" [HCP]

Several stakeholders remarked there was a lack of support and guidance for the Lead Dietitians within some Health Boards when it came to Information Technology (IT) issues and there was a general acceptance that some IT issues were to be expected.

"e had some teething problems with searches and templates, but you know over the summer those have been ironed out." [HCP]

"IT problems are always an issue." [HCP]

The issues discussed by stakeholders were echoed in the delivery team interviews where both Lead Dietitians and HCSWs expressed frustration about the lack of IT support. It was felt that the responsibility for installing the minimum dataset template (to collect data on programme

activity) on GP systems could have been centralised and that practice agreements should be agreed and put in place when the primary care cluster agrees to implement the programme. before any data sharing occurs.

Whilst the AWDPP training package overall was seen as good, HCSWs received limited formal systems training, with some training materials obtained after they had already started working in practices. The training on General Practice searches was described as '*useless*' and *'inadequate'*, by some HCSWs and the delivery team relied on exploring the systems themselves with some help from colleagues and General Practice staff. HCSWs reflected on the risk of missing important service user information or creating mistakes in service user records when accessing the various systems without the perceived skills to do so.

> *"My biggest kind of barrier was probably the IT side of things with knowing … like I went on the system training, but for things like managing waiting lists and managing how … the best way to …. has been a headache because obviously every … there's not the same systems in every GP … So I still have to go and get somebody, then … so it can feel a little bit embarrassing that I'm running round and trying to get somebody to help me … some places have IT managers, some people don't. But they are very helpful to me, it's just it's not turn up, pull the data and go! It's turn up, oh right I can't access this, right, who can I go and find? Oh now this isn't working … right, how do I extract it? So it could be a three hour job to be honest just to get ninety five names off the system."* [HCP]

It was suggested by some of the HCPs that the training package for HCSWs could have included appropriate training on how to use primary care software such as Vision or EMIS to aid the efficient identification of service users. More thorough training would have been beneficial and could have made the process quicker. Confidence in using the systems improved with practice, but at the beginning many HCSWs felt they escalated many service users unnecessarily to their Lead Dietitian to review. It was also suggested that the process could be refined to make it easier to locate and extract the desired data. This would save time and reduce the need for help from practice managers, especially when HCSWs are working remotely.

5.2.2.5 Stakeholder Engagement

Stakeholder engagement was seen as key to ensuring a successful national roll-out of the programme and the implementation model required a partnership approach between local and national public health, primary care, and dietetics professionals – meaning there were a large number of stakeholders to engage. Local and national multidisciplinary and multi-agency steering groups were established with a wide variety of stakeholders invited to participate.

> *"I think one thing that's unusual about this programme is it is this sort of tripartite approach between primary care public health …and dietetics predominantly. But that means with more and more partners there's more and more stakeholders and local engagement and local discussions"* [HCP]

> *"…involving your clinical team early on with the project, … making sure the doctors are aware, making sure the nursing staff are aware that …this is what we're hoping to achieve, I think that's critical."* [HCP]

Despite efforts to engage with all the relevant stakeholders, some stakeholders felt it had been accepted that implementation of the national programme had to go ahead without always having all the stakeholders on board as there has been pressure to deliver the programme in at least some areas of Wales. Meeting attendance declined after the initial enthusiasm of the development phase, possibly due to meeting burden. This was reported as causing tension

with some of the stakeholders interviewed from the Health Boards in the approach from the central AWDPP teams.

"I think there have been occasions where we've just basically said, this is the national approach, and whilst you're not going to come on line for a little bit, we recognise that but we can't put the national programme on hold, so we're just going to have to recognise that in this patch, that's a variation, that we're just going to have to acknowledge that that service isn't available there." [HCP]

The importance of engagement with primary care professionals was stressed by members of the national implementation team and feedback from the GP Survey indicates that the majority of practices that responded would like to be more involved in the programme. Where time had been taken to build relationships with the practice, local implementation had gone well. However, as involvement in the programme falls outside of the standard GMS contract, there was an expectation of reimbursement for the time spent supporting the roll-out of the programme from primary care stakeholders. Some expressed frustration in how difficult it was to get reimbursed for their time and felt some of their colleagues may feel undervalued within the AWDPP implementation as a result.

"So how do we get GPs, practice nurses, … other stakeholders … to see the importance of coming to these meetings? Because … you can't have a stakeholder meeting without the stakeholders! ... In reality change … takes time, and if you want that change to be accepted well, you need to give primary care locations time to accept that change that's coming. And I think where we have taken things a little slower with some surgeries, … it's gone so much better … relationship building takes time." [HCP]

"Really difficult to get reimbursed for an hour of time, which is depressing really because they need our expertise and there's stuff we've got to say that is helpful." [HCP]

There were mixed experiences and approaches reported from the delivery team regarding their way of working with GPs, though it was felt that GPs were perhaps not aware or had limited information of the AWDPP programme or what it is about. This lack of awareness was felt to delay implementation, limit the service user experience, and reduce service user trust in the programme where the GP practice staff were unaware and as such unable to verify or vouch for the programme. The perceived lack of awareness of the AWDPP was further supported by the GP surveys where 43% of the respondents noted they were only 'somewhat' informed about the AWDPP and 22% of respondents noted they were 'not at all informed'.

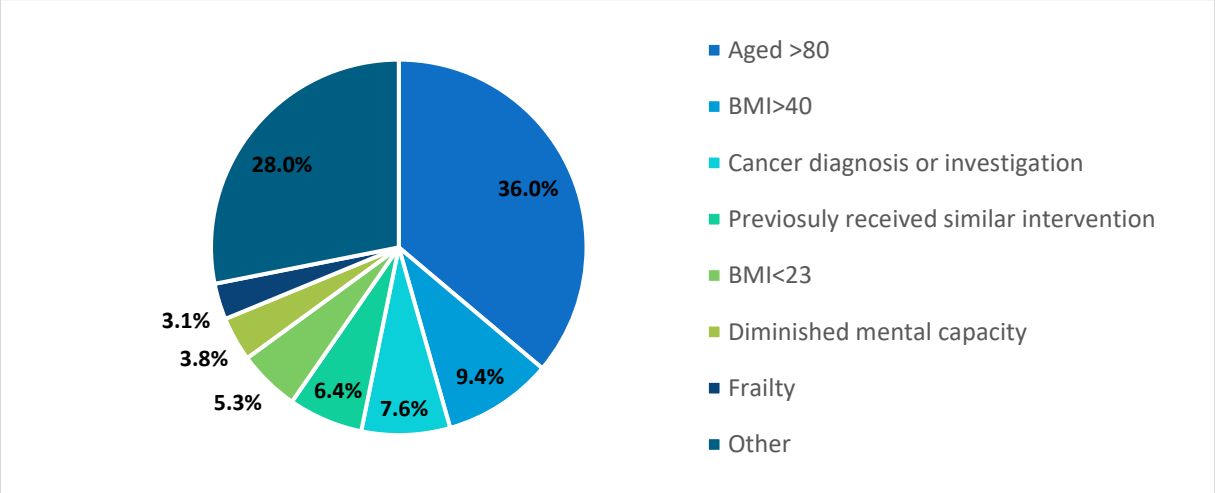
5.3 Understanding the Delivery and Implementation of the Programme

Building upon our description of the implementation of the AWDPP (Section 5.1 and Table 5) we report on the lifecycle of the delivery of the AWDPP that we captured during the evaluation period.

5.3.1 How many people were eligible, escalated and excluded?

Data from the Service User Database shows that between June and December 2022, 3,158 people were identified as at risk of developing T2DM using the AWDPP eligibility criteria in 29 General Practices. Of the 3,158 people identified as eligible for the programme, 1,043 (33%) were escalated to be reviewed by the local Lead Dietitian to assess their suitability. As illustrated in Figure 2, the main reasons for escalation were, the person being aged over 80 years (n=380, 36%), had a BMI >40 kg/m^2 (n=98, 9.4%) or had a diagnosis of or investigation for cancer (n=79, 7.6%).

Figure 2: Reason for Escalation to a Lead Dietitian



Data taken from the Service User Database, *n* = 3,158

Sixty-seven people (6.4%) were escalated to the Lead Dietitian because they had already received a similar intervention. This was due to some General Practices already delivering 'diabetes prevention' initiatives. It is unclear whether all those escalated for this reason were subsequently invited to take part in the AWDPP, but it is clear from the responses from the Service User Survey and interviews that some were.

> *"I was quite happy to receive it [invitation] because I'd already been made aware by my local healthcare centre that I was pre-diabetic…. I'd already had an interview with the healthcare adviser at my medical centre." [Service User]*

Of those escalated to the Lead Dietitian for review, the programme was deemed clinically inappropriate for 56% (n=608) which means 19% of those originally identified as eligible for the programme were subsequently excluded and not invited to take part. It is important to understand the reasons for exclusion, not just escalation, as there may be a case for reviewing the inclusion / exclusion criteria and the search template identifying people for the programme.

"So I think the right people are being excluded. Like I've excluded I think over a hundred of over-eighties for example" [HCP]

"And then the other thing actually, just with exclusion criteria that I know that has been discussed a lot is more elderly patients, and how to deal with patients over eighty, where it may be almost quite a minor thing [being at risk of T2DM] in terms of the impact on their health… and that we're now … a new/any patient over eighty, I just note that and then the dietitian goes through and does a more in-depth triage." [HCP]

Using the SAIL data subset, the details of 485 people who had been identified as eligible to be invited to take part in the AWDPP between June to mid-October 2022 were retrieved. These details give a more in-depth insight into the characteristics of the AWDPP service users in the first few months of delivery. Data were only available for Health Boards where clinics were running before mid-October, i.e., Aneurin Bevan, Betsi Cadwaladr, Cardiff & Vale, Cwm Taf Morgannwg and Swansea Bay. In line with the guidance to use SAIL data, numbers less than 5 are not reported. Figures for minimum and maximum values are also not able to be shared.

From the SAIL data, no differences in mean HbA1c levels between those excluded and invited to take part in the programme were identified. However, the mean weight and BMI were lower for those excluded than those invited (Table 6), although t-tests indicated that these differences were not statistically significant. Slightly more men (18%) than women (11%) were excluded from the programme (Table 7).

Table 6: Service User Characteristics – Invitation vs. Exclusion

		N	Mean (95% CI)
Age (y)	Invited	414	62.8 (61.68, 64.02)
	Excluded	71	73.1 (69.84, 76.44)
HbA1c (mmol/mol)	Invited	414	43.8 (43.65, 43.95)
	Excluded	71	43.3 (43.00, 43.65)
Weight (kg)	Invited	245	91.7 (88.76, 94.68)
	Excluded	38	84.9 (76.20, 93.59)
	Data unavailable	202	-
BMI (kg/m^2)	Invited	245	32.7 (31.78, 33.66)
	Excluded	38	30.2 (27.28, 33.05)
	Data unavailable	202	-

Data taken from the SAIL Databank, *n* = 485

Table 7: Service User Invitation vs. Exclusion by Gender

		Invited		Excluded		
		N	%	N	%	Total
Gender	Male	191	81.9	42	18.0	233 (48.0%)
	Female	223	88.5	29	11.5	252 (51.9%)
	Total	414	85.4	71	14.6	485

Data taken from the SAIL Databank, *n* = 485

There were no significant trends in the rates of invitation and exclusion across the 5 Welsh Index of Multiple Deprivation (WIMD) categories, with the percentage invited being between 80-94%. The proportion of individuals identified was highest for the most deprived WIMD categories, reflecting the demographics of the primary care clusters participating in the AWDPP during the evaluation period. There were incomplete data available in the SAIL subset on the ethnicity or disability status of those excluded from the programme and no data on these characteristics were able to be shared via the Service User Database, therefore no comment can be made on these characteristics.

Fewer people being escalated for review would reduce the Lead Dietitian workload and that may happen naturally over time as the HCSWs become more experienced and confident in their roles. Information gathered from the HCSW interviews suggests they felt they were escalating fewer people and making decisions on who to exclude as they gained more confidence.

"This is where the dietitian's been helpful because some of us were out of our depth with some of the conditions that were new to me. So now I'm more confident to go on my own and I just exclude who I think should be excluded and [Lead Dietitian] checks them for me, so that's working well." [HCP]

This cannot be verified by the aggregated data available to the current evaluation but would be expected. The Lead Dietitians felt further discussion was needed around service user identification and inclusion in the programme.

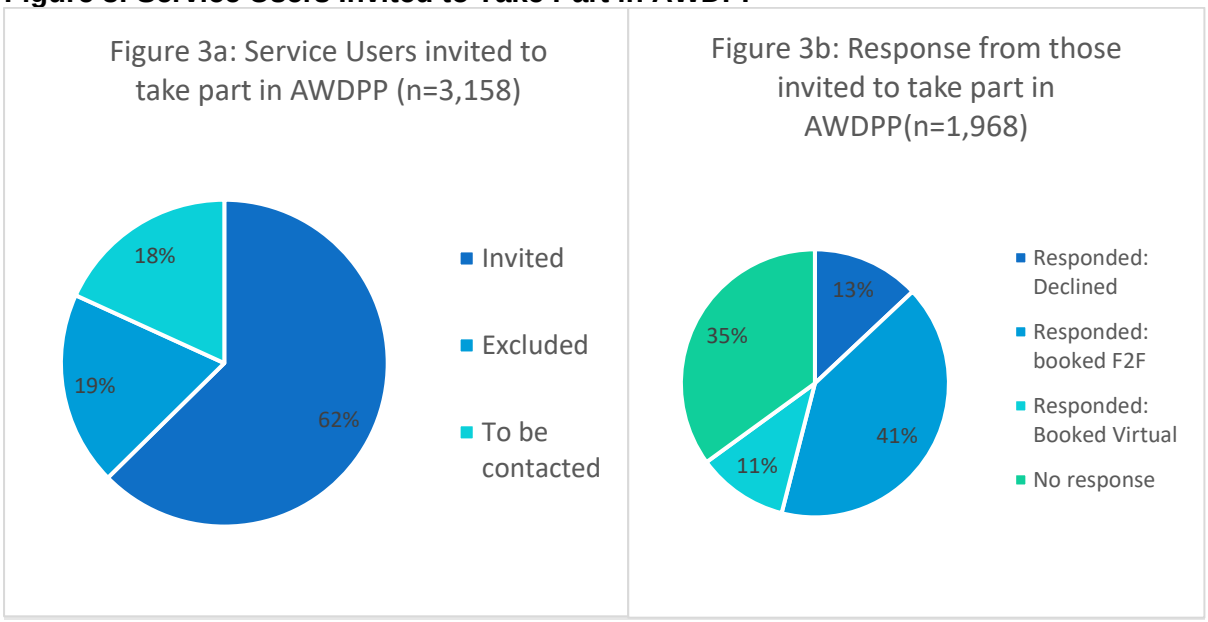
"Some more training or some more discussions on when we're triaging and escalating patients, and then how as dietitians we're managing those type of patients." [HCP]

"Discussion around the triage and the management of patients ……So having some time out really to tease out those processes, you know in terms of equality for the programme." [HCP]

5.3.1.1 How many people were invited and took part?

The Service User Database showed that of those eligible for the programme, 1,968 (62%) were sent at least one invitation letter and 1,280 people (65%) responded to the invitation (Figure 3). In total 1,015 people (79% of those who responded and 52% of those who were invited) accepted an appointment.

Figure 3: Service Users Invited to Take Part in AWDPP



Data taken from the Service User Database

A total of 801 people had attended an AWDPP appointment either face-to-face or virtually by the end of December 2022. Table 8 shows the number of people identified, invited, excluded and who participated in the programme by Health Board.

Table 8: Service User Involvement in AWDPP

Service Use (July to December 2022)	Aneurin Bevan UHB	Betsi Cadwaladr UHB	Cardiff and Vale UHB	Cwm Taf Morgannwg UHB	Hywel Dda UHB	Powys THB	Swansea Bay UHB	All Wales Total
Identified as eligible (search template run on GP systems to identify potentially eligible people for the AWDPP)	**817**	**199**	**1020**	**239**	N/A	**404**	**479**	**3,158**
Invited to appointment (1st contact)	464 (57%)	129 (65%)	702 (69%)	134 (56%)	N/A	247 (61%)	292 (61%)	**1,968 (62%)**
Accepted face-to-face appointment	185 (40%)	49 (38%)	287 (41%)	50 (37%)	N/A	62 (25%)	167 (57%)	**800 (41%)**
Accepted virtual appointment	42 (9%)	8 (6%)	97 (14%)	5 (4%)	N/A	48 (19%)	15 (5%)	**215 (11%)**
Responded & declined appointment	66 (14%)	20 (16%)	87 (12%)	15 (11%)	N/A	53 (21%)	24 (8%)	**265 (13%)**
No response (at time of data extraction)	171 (37%)	52 (40%)	231 (33%)	64 (48%)	N/A	84 (34%)	86 (29%)	**688 (35%)**
Attended appointment	**179 (89%)**	**50 (94%)**	**317 (91%)**	**32 (91%)**	N/A	**90 (97%)**	**133 (91%)**	**801 (91%)**
Did not attend appointment	23 (11%)	3 (6%)	30 (9%)	3 (9%)	N/A	3 (3%)	13 (9%)	**75 (9%)**
Service users still to be contacted								**582 (18%)**
Service Users escalated to Lead Dietitian for review*	**348 (43%)**	**50 (25%)**	**222 (22%)**	**34 (14%)**	N/A	**168 (42%)**	**221 (46%)**	**1,043 (33%)**
Outcome of escalation**: Clinically inappropriate, exclude	156 (19%)	80 (40%)	149 (15%)	26 (11%)	N/A	44 (11%)	153 (11%)	**608 (19%)**
Referral to support services								
Referral to weight management support	33 (18%)	2 (4%)	67 (21%)	11 (34%)	N/A	14 (16%)	3 (2%)	**130 (16%)**
Referral to physical activity support	7 (4%)	18 (36%)	30 (9%)	5 (16%)	N/A	2 (2%)	8 (6%)	**70 (9%)**
Referral to other e.g. Online support	119 (66%)	0	193 (61%)	0	N/A	0	35 (26%)	**347 (43%)**
Total	**159**	**20**	**290**	**16**	N/A	**16**	**46**	**547**
% of service users referred for additional support	**89%**	**40%**	**91%**	**50%**	N/A	**18%**	**35%**	**68%**

Data taken from Service User Database recorded by the HCSW / LDs. All data up to 31st December2022. Hywel Dda UHB had not delivered any clinics up to this date but have been included for completeness (N/A)

*Number of service users escalated for review is a slight underestimation as in categories with small numbers (<5), the actual number was removed and replaced with 1 before being shared with the evaluation team.

** Outcome of escalation, where known. Some cases would be waiting for review

Not all those invited to take part in the programme went on to make an appointment and at the end of December 2022, 265 people (13% of those offered and 21% of those who responded) had declined the offer of an appointment. The main reasons for declining the invitation included the person feeling they already had enough information, they had already started to make lifestyle changes, or it was not currently a priority for the person. Further details on reasons for declining the invitation can be seen in Table 9.

Table 9: Reason for Declining the Invitation

Reason	Aneurin Bevan UHB	Betsi Cadwaladr UHB	Cardiff and Vale UHB	Cwm Taf Morgannwg UHB	Hywel Dda UHB	Powys THB	Swansea Bay UHB	Total
Caring responsibilities	4	4	0	0	N/A	0	1	**9**
Work	1	1	0	0	N/A	3	0	**5**
Education	0	0	0	0	N/A	0	0	**0**
Unwell	6	0	8	5	N/A	3	1	**23**
Not a priority for service user	16	2	13	2	N/A	10	4	**47**
Lack of transport and declined virtual/phone appt	0	0	0	0	N/A	0	0	**0**
Have enough info	21	3	40	1	N/A	2	4	**71**
Already started making changes	6	8	14	5	N/A	17	7	**57**
Other	11	2	11	2	N/A	4	5	**35**
Not known	1	0	1	0	N/A	14	2	**18**
Total	**66**	**20**	**87**	**15**	**N/A**	**53**	**24**	**265**

Data taken from the Service User Database
Hywel Dda UHB had not delivered any clinics up to 31st December 2022 but have been included for completeness (N/A)

All cluster areas were running morning and afternoon appointments during weekdays and data from the Service User Survey and Interviews indicate that those who attended an appointment were satisfied with the time, location and method of delivery of the appointment. However, a small number of those who declined an appointment stated they were unable to attend due to caring or work commitments. This was supported by data from the HCSW interviews,

"There are some patients who say, oh I can't do that because of work and then they prefer telephone or video appointments. But mostly, I suppose partly because of the age range that we're seeing, they seem fine with the hours." [HCP]

A small proportion of people (8% n=75) booked an appointment but did not attend. There was no information available to the evaluation whether these people rebooked an appointment.

Within the SAIL subset, 329 people (80%) responded to the invitation and either booked an appointment, (279 people, 68%) or declined the invitation (50 people, 12%). This was slightly different to the larger dataset where 65% responded to the invitation and 52% had booked an

appointment, but the proportion of people declining the invitation was virtually the same. Of the 279 people who accepted an appointment, 27 (8%) did not attend it, as was the case with the larger dataset.

The majority of the appointments booked and that took place were face-to-face appointments (79%) with the remaining appointments delivered virtually, predominately taking place over the phone. This was reinforced by the SAIL data that showed 85% of the 252 appointments that were delivered took place face-to-face (Table 11).

5.3.1.2 Characteristics of those taking part in the AWDPP and those who declined

Data from the SAIL Databank indicates that overall, nearly half of service users identified as eligible for the AWDPP were from the most deprived households (Quintile 1) in Wales (48%, n=225). This was reflected in the number who went on to attend the programme, with 44% of people (n=109) coming from the most deprived households in Wales.

SAIL data also illustrated that the mean age of those attending the programme was 64.3 years, the mean HbA1c 43.8 mmol/mol, the mean weight 88.7kgs and the mean BMI 32.0 kg/m^2 (Table 10). Data from the Service User Questionnaire suggests the majority of those who engaged with the AWDPP so far describe themselves as White British (91%) and 18% consider themselves to have a disability.

Table 10: Service User Characteristics by Attendance

		N	Mean (95% CI)
Age (y)	Attended	252	64.3 (62.79, 65.79)
	Declined	50	61.9 (58.02, 65.86)
	DNA	27	57.2 (52.01, 62.36)
HbA1c (mmol/mol)	Attended	252	43.8 (43.60, 44.01)
	Declined	50	43.7 (43.32, 44.08)
	DNA	27	44.2 (43.56, 44.88)
Weight (kg)	Attended	166	88.7 (85.48, 91.91)
	Declined	26	96.6 (85.83, 107.40)
	DNA	12	107.9 (84.47, 131.36)
	Data unavailable	125	-
BMI (kg/m^2)	Attended	166	32.0 (30.95, 32.96)
	Declined	26	34.5 (31.07, 38.00)
	DNA	12	37.8 (32.26, 43.36)
	Data unavailable	125	-

Data taken from the SAIL Databank, n=329 service users who responded to the invitation

There were a few differences in the characteristics of those who attended the programme compared to those who declined or DNA (booked an appointment but did not attend) as illustrated in Table 10. From analysis of the SAIL data, the average age of those attending the appointment (64.3 years) was over 2 years older than the average age of those declining (61.9 years), and 7 years older than those who Did Not Attend (DNA) (57.2 years). An ANOVA F-test showed a statistically significant effect of age on the attendance status for AWDPP ($F=4.32$, $p=0.01$). Also, the mean weight of those attending AWDPP appointments was around 8kg less than those declining, and around 19kg less than the average weight of DNA's. Similar

findings were observed for BMI. ANOVA F-tests found both weight and BMI to have a significant effect on attendance. Individuals from the most deprived households had the lowest rate of attendance (71%) and the highest rate of decline (20%). Individuals from the two least deprived categories had the highest attendance percentages (WIMD Cat 4 = 93%, WIMD Cat 5 = 91%).

The SAIL data also indicated that there was no difference in the delivery mode between males and females, however, individuals in the 70-79 and 80-89 age groups were less likely to have had a virtual appointment. The mean EQ-5D 5L utility was slightly higher amongst service users attending virtual appointments, whereas mean VAS scores were slightly higher amongst those attending a face-to-face appointment; differences were not statistically significant and represent the health status of service users prior to receiving the AWDPP intervention.

Table 11: Service User Characteristics – Face-to-Face vs. Virtual Appointments Delivered

		N	Mean (95% CI)
Age (y)	F2F	213	64.6 (62.95, 66.20)
	Virtual	33	62.5 (58.22, 66.75)
	Data unavailable	6	-
HbA1c (mmol/mol)	F2F	213	43.9 (43.63, 44.07)
	Virtual	33	43.6 (43.06, 44.09)
	Data unavailable	6	-
Weight (kg)	F2F	143	88.6 (85.26, 92.00)
	Virtual	18	87.6 (74.84, 100.38)
	Data unavailable	91	-
BMI	F2F	143	32.0 (30.90, 33.08)
	Virtual	18	31.3 (28.30, 34.38)
	Data unavailable	91	-
EQ-5D Utility	F2F	180	0.66 (0.62, 0.70)
	Virtual	22	0.73 (0.63, 0.84)
	Data unavailable	50	-
EQ-5D VAS	F2F	180	69.5 (66.39, 72.53)
	Virtual	22	62.0 (52.26, 71.74)
	Data unavailable	50	-

Data taken from the SAIL Databank, *n* = 252 attendances

Responses from the 116 people who completed the Service User Survey suggest just over half of those who attended the programme and then completed the Survey were already aware that they were at risk of developing T2DM, although how recently they were made aware is not known. Those who attended the appointment and took part in the evaluation welcomed the opportunity to discuss it again, whilst many of those who were unaware they were at risk expressed shock or surprise at receiving the letter.

"And because I have been pre-diabetic before, …. I think it's best to keep a check on it…. I was pleased to receive it [invitation] and I feel it's important that … I keep tabs on." [Service User]

"I was shocked to receive letter informing me that I was borderline diabetic so felt it was important to find out more about it all." [Service User]

5.3.1.3 Referral to support services

From the Service User Database, overall, 68% of people who attended an AWDPP appointment were referred onto another service for additional support (Table 8).

One hundred and thirty people (24%) were referred to weight management services, 70 (13%) were referred to physical activity support such as NERS and 347 people (63%) were referred to other services such as the 'Let's Prevent Diabetes' online programme and smoking cessation. There was quite a variation in referral rates between the local Health Boards ranging from 18% to 91%. This may be partly due to the variation of local services on offer, the local capacity and the HCSWs ability to refer to the service. HCSWs in one Health Board explained they were not able to refer directly to NERS because of their banding.

"We're not allowed to refer because of the band that we're at, we have to just inform the patient that this exists [NERS] and then tell them to either go on self-referral on-line or go to their GP." [HCP]

Service user engagement and choice will also play a part in the varying referral rates as these data reflect the referrals made and not the total referrals offered to service users, which may have been higher.

"I definitely thought I'd be like referring everyone every session, but a lot of people sort of say that they know what they need to do." [HCP]

SAIL data (Table 12) suggested that females had a higher rate of referral (53.0%) compared to males (42.5%). Additionally, service users in the 70 to 79 and 80 to 89 year age groups had a lower rate of referral than younger people and that the least deprived group had a greater rate of referral to other services (58.6%) than those in the other WIMD groups. An increase in referral rates as the programme became more established was also observed. Comparing referral rate across delivery mode, those attending a face-to-face AWDPP appointment had a higher rate of referral (48.8%) compared to those attending a virtual appointment (39.4%).

Table 12: Referrals by Gender

	No referral to any service		Referred to Services*		Total
	N	%	N	%	
Male	69	57.5%	51	42.5%	120
Female	62	47.0%	70	53.0%	132
Total	131	52.0%	121	48.0%	252

Data taken from the SAIL Databank, *n* = 252

* Inclusive of referrals to All Wales Weight Management pathway, National Exercise Referral Scheme, and other services

5.4 Is the Intervention Being Implemented as Planned?

Implementation and intervention fidelity to the national protocol by each Health Board was assessed using data from the stakeholder, HCSW and service user interviews, stakeholder focus group, observed clinic and the service user and GP surveys.

Overall, the national protocol has been implemented as planned, across the majority of Health Boards. There was one exception where one Health Board had already planned to implement a Diabetes Prevention Programme Health Board wide and adopted the majority of the national protocol with some local modifications. This Health Board did not deliver any clinics within the

evaluation period but plan to deliver a slightly longer first appointment with additional follow up appointments using higher grade staff. The higher grade staff (Health & Wellbeing Facilitators) will be supported by administrative staff who will undertake many of the administrative tasks such as liaising with practices, sending invitations and booking appointments. The clinics are also planned to be delivered in community settings.

Amongst the Health Boards that delivered clinics during the evaluation period there was evidence of some deviation from the original protocol. All Health Boards have been escalating service users over the age of 80 years for review, as evidenced in the Service User Database and HCSW interviews and the data from SAIL suggests a large proportion of those aged over 80 years of age and escalated are then being excluded from the programme (55%). The agreed protocol is to escalate individuals over the age of 85 years. There was also evidence from the Service User Database that four Health Boards were escalating people with a BMI over 40kg/m^2, and in some cases excluding them. This may be to refer individuals on to specialist weight management services rather than the AWDPP, but there was some concern that weight management services were already busy and attending the AWDPP session might be helpful as a short-term intervention.

> *"I think they've recently updated the inclusion criteria to exclude more different groups. And I think generally after we've seen everyone, the patients do seem clinically relevant to us. We've had one thing in particular as like BMIs over 40 I think has been excluded, but I'm just aware that our weight management programme has massive delays and so it feels a bit strange to have to exclude them when they may be really relevant, but we want to steer them to another programme."* [HCP]

The protocol states individuals with a low BMI (under 24kg/m^2) are escalated for review but does not mention those with a higher BMI.

The use of physical materials, such as visual aids used at the appointment and information leaflets given to service users to take away, has also varied across Health Board with deviations from the original protocol. Feedback from the Service User Survey and interviews demonstrate that many people did not receive all of the information leaflets intended in the protocol with 58% of service users reporting receiving the AWDPP general information, 74% the Eatwell Guide, 67% Diabetes UK Eating Well, 54% Diabetes UK Be Active and 40% Let's Prevent Diabetes leaflet. Some of this variation could be due to tailoring of the intervention to the individual and providing a personalised approach, however, there was a pattern to the information being distributed by each Health Board and information gathered via the stakeholder and delivery team interviews indicate that this was more likely down to local modifications at Health Board level rather than individual tailoring. Despite the lack of information distributed in some areas, service users who provided feedback via the survey indicated that they were satisfied with the information provided.

The variation in rates of referral to support services following the AWDPP appointment also reflects individual tailoring and HCSWs described how they discuss with the individual their needs and abilities before offering referral to additional services. However, local service provision is likely to be partially responsible for the apparent inequitable distribution of referrals to support services, as evidenced by the HCSWs and Lead Dietitians and already discussed. Equitable access to appropriate support services will require involvement of stakeholders outside of the AWDPP to effect change.

The Theory of Change model originally developed by PHW identified a number of key resources that were expected to be in place at the start of the programme for it to be delivered as planned. A brief summary is presented in Section 5.6.1. These include key staff, such as local Dietitians and HCSWs. Access to and confidence using IT systems in general practice are also seen as key to successful delivery of the programme. Significant issues have been

reported both with staff turn-over amongst the HCSW workforce, where approximately half of those originally appointed have left their post, and with access to GP systems. This resulted in delays to set up or pauses in clinic delivery and delays and difficulty identifying service users eligible for the programme.

The Theory of Change Model also assumes that each Health Board will have HCSWs in place with support from local dietitians and management. This has not been the case in all of the Health Boards with engagement from more senior Health Board colleagues sometimes lacking, and confusion where the programme sits within the larger organisation. The reasons behind this are unclear and could be due to competing priorities within local Health Boards but this was evident in four of the Health Boards and has had an impact on the ability of the Lead Dietitian to resolve some of the local programme set up issues such as access to GP systems and negotiation of data sharing agreements, whilst also impacting morale. The Health Boards with clear and supportive management of the programme seemed to have been the early adopters of the AWDPP.

"...it has been one of the big challenges …. having to get legal advice …. again as a dietitian, it's something completely new and unfamiliar to us, and yet it feels we've been left with the responsibility of it and that feels quite worrying really…. it all just feels a little bit unsafe and I just don't feel very secure about it. I just feel this is beyond what I should be ….held responsible for really, because it is such a big deal. So it's not a very pleasant feeling, having that responsibility." [HCP]

5.5 Dynamic Contextual Factors

The contextual factors that were identified as influencing the AWDPP implementation were collated into four categories (i) Policy, (ii) Organisational programme characteristics, (iii) Leadership and (iv) Relationships. A summary of how, why, when and for whom these identified categories are important are summarised in Table 13.

Table 13: Examples from the evaluation findings of how, why, when and for whom the identified contextual categories are important

Contextual Factor	How is this important?	Why is this important?	When is this important?	For whom is this important?
Policy	There is no separate diabetes prevention funding stream/commitment	Funding models for the diabetes prevention work varied within and across HBs, resulting in differences in available health care services, the organisation and delivery of services, and ability to implement innovations	All stages - planning and pre-implementation phases—prior to the wave 1 and further roll-out of the AWDPP, sustainability	Stakeholders, individuals, and delivery teams, service users
Organisational programme characteristics	Formal structures (equipment, training) influence delivery capability and opportunity Empowers individuals / teams to deliver the AWDPP	The programme infrastructure (clinic sites, equipment, technology, governance, administrative and organisational arrangements) ensure efficiency, cost reduction, sustainability, good standards of care / good care experience	Planning and pre-implementation phases—prior to the wave 1 and further roll-out of the AWDPP	Individuals, delivery teams, service users
Role /leadership	Clarity on autonomy and responsibility from role banding influence staff retention Leads that were present and	Recognising the level of skill, independence and complexity of the work undertaken by the HCSWs through adequate banding will empower them in their roles and increase retention Encouraging leaders facilitate shared	Planning and pre-implementation phases—prior to the wave 1 and further roll-out of the AWDPP, sustainability To support motivational efforts and address	Dietetic leads and HCSWs

	enthusiastic about the AWDPP have a motivational effect on staff, and the support by leaders lead to a more positive experience of AWDPP and delivery	responsibility, promote progress and empower others to develop a passion for their work and how they accomplish it	operational and organisational barriers (capacity and opportunities)	
Relationships	Fosters programme ownership and shared goals across the stakeholder groups	Flattens hierarchies, delegates responsibility, and aligns the interests of multiple stakeholders Improves access, support, efficiency, delivery and service user experience	All stages of programme implementation and delivery	Stakeholders, individuals, and delivery teams, service users

5.5.1 Policy

Welsh Government provided funding for a three-year phased roll-out of the AWDPP. Whilst the considerable personal and health impact of developing T2DM has been recognised as important enough to warrant central funding, delivering this national diabetes prevention programme has not occurred in a vacuum. As described elsewhere (Section 5.2.1) many Health Boards had their own policies that focussed on prevention. Some Health Boards / primary care clusters had independently decided to implement local interventions that would directly or indirectly support diabetes prevention, prior to the implementation of the AWDPP. In some Health Boards, there was evidence that this additional support and alignment of policies was welcomed. In some settings some navigation through the different initiatives focussed directly or indirectly on diabetes prevention was needed and a degree of finding the best way of working, whilst not confusing service users, was required.

Current Welsh Government funding covers two primary care clusters within each Health Board, and at the time of writing this report (May 2023) no separate or continued diabetes prevention funding stream / commitment has been agreed (to our knowledge) by Welsh Government. There was interest to adopt the AWDPP by more primary care clusters and other funding models were explored and obtained by some. This varied access has an impact on equity, resulting in differences in available health care services for service users.

The initial funding from Welsh Government was seen as critical to developing and delivering a standardised, national diabetes prevention programme for Wales. Without the funding it was felt by many that local delivery of diabetes prevention work would be inequitable at best with inconsistent delivery of the intervention and some Health Board areas not delivering any programme.

"I think if there wasn't that pot of money from Welsh Government to do this, we would just continue to have an inconsistent diabetes prevention service." [HCP]

Comparisons were made to the provision of diabetes prevention services in the other UK nations, in particular England and Scotland, that are nationally funded, and anxiety was expressed over the longer-term funding and sustainability of the programme in Wales.

"So there has to be funding from Welsh Government for the national diabetes prevention programme, which should fund all clusters to have this rolled out to them. And that needs to be … ring-fenced funding from Welsh Government. What I do not want to see is that Health Boards are asked to fund this themselves… because my concern is that because of the financial strife in which some Health Boards find themselves, they will not be able to offer the entirety of the programme or will decide not to, …, and in my opinion, that is unacceptable. In England, it's funded by Government, in Scotland the same, …I want to see national ring-fenced Welsh Government funding for this, for everybody in Wales." [HCP]

It was felt important to have a longer-term vision for the future for the programme with stable, sustainable funding. It was suggested that perhaps diabetes prevention work could become part of 'core' business within primary care and covered by the General Medical Services (GMS) contract. It was also suggested that diabetes prevention be combined with other chronic disease prevention programmes and one multi-condition lifestyle intervention programme developed targeting chronic conditions with the focus on weight management.

"The imperative is that we get continued ...and stable sustainable funding. So from my perspective, I don't think it should be run on a three year basis, …the funding needs to be basically a sustainable funding stream, but also a dedicated funded stream." [HCP]

"What we will eventually have, I'm assuming, is a multi-condition health check for people with risk factors." [HCP]

5.5.2 Organisational programme characteristics

The range of systems used and GP structures across and within Health Boards and primary care clusters was challenging as the delivery team had to familiarise themselves with GP systems and identify sites and available resources in different practices to determine how they could best deliver the AWDPP in different settings.

5.5.3 Equipment

The impact from lack of key resources like phones, IT equipment was noted by some of the delivery teams where there were such issues. These issues were due to NHS procurement procedures and not specific to the AWDPP programme but nonetheless should be noted.

"We did try ordering some [phones] very early on, and I think the order got delayed, they said they didn't have any phones, they didn't have any SIM cards, it's just been a constant thing of trying to get them from procurement. It's the same I think with all …. So going back and forth between people and expenses …and we still haven't got them. I think [colleague HCSW] has ended up going back to … back to like her old place and asking if she could … if her old work phone was being used. So yeah, it's been an absolute nightmare trying to get stuff like that sorted. Yeah, so we've got laptops but that was about it, so … I think [colleague HCSW] managed to order a headset, but that took over a month to arrive, I just went to the supermarket and bought some headphones." [HCP]

5.5.4 Clinic sites

The range of Health Board and primary care cluster settings that the delivery teams worked in influenced the implementation of the AWDPP. There was variety in access to sites to host AWDPP clinics. For those where this was a challenge, it did add delays to clinic delivery and decrease efficiency, as a lot of time was spent searching for a suitable venue and HCSWs had less time to prepare for clinics and other tasks. The HCSWs became resourceful in identifying and accessing sites, however as sometimes these sites were not used by other services, there could be no reception support to welcome service users upon entry if the HCSW was engaged in a session. Efforts were made to mitigate the impact on delivery and service user experience though both were impacted.

"I'm currently based in an ex-GP clinic, so there is no receptionist or other member of staff who can kind of hand it to them before the surgery. The first time we turned up to have a clinic for me, the building was completely locked and we didn't have access and so we had to wait for a locality lead to come in." [HCP]

"Well I … we haven't really had any sort of the GP surgeries giving us any rooms at all, we've kind of mentioned it to [Lead Dietitian] a couple of times, asking if she could ask them and she just sort of says no, they said no. So it kind of leaves us scrapping to try and find rooms elsewhere to be able to offer those face-to-face clinics. Yeah, it's a difficult one because the [x] for someone with limited mobility probably it's not the easiest place to get into. So yeah, I think people, if they do have access of like accessibility problems, we just tend to offer them virtual instead then, which is a shame … so it's quite difficult over the telephone because you've kind of got nothing that you can show them. But without sort of … without any resources to show them, it's sort of like I could send you this afterwards and … but then it's the first time they're seeing it, so they can't really talk through anything with you." [HCP]

For those where clinic sites were readily available via GPs, there were reports from healthcare professionals of improved GP relations, with support from reception staff and confidence in delivery.

"The kind of more smaller, more traditional practices are fabulous. I also have the same room, they know who I am, they expect me, they put the names … because a lot of them will put the patient … I send every surgery the patient list, they'll put them on the system so I can actually call them through by appointment." [HCP]

"I think I've been quite lucky. So [x] Medical Practice are amazing, they're incredibly friendly, they said we've got a room and you can use this room, plenty of space. So yeah, I think I've been quite lucky on that …" [HCP]

5.5.5 Training

The core training, especially the motivational interviewing training, was highlighted as positively impacting the HCSWs confidence to deliver the AWDPP.

"I think there were some elements of the training that were kind of at a basic level, but from actually conducting the … the clinics now that I've started, I think that the level of training that they did offer, especially the motivational interviewing, was really good quality. And having those skills allows you to have a lot more broad conversations, because...patients come to you with so many issues other than the diabetes that means that you have to be kind of prepared for lots of different situations. So I don't think that they'd really be able to adequately train you for every single thing. I think it's just

knowing that obviously you have the support from the dietitian and all the signposting and things." [HCP]

"Yeah, the motivational interviewing isn't something you take on overnight, but it's been very gradual, and I feel that I've had to do all the sessions to get better, … I do feel very confident going into each session now, and I've still got loads to go! I feel that I'm giving benefit and quality to the people that I see through what I've learnt and what I've been taught and applying it in the right way, so …" [HCP]

However, training on how to use the GP systems was felt to be inadequate with multiple HCPs describing how they struggled to navigate the systems and their apprehension using them. Some reported being supported by practice managers and other practice staff in order to run the AWDPP clinics.

"I just think it's such a big gap in the training provided for the support workers and ourselves. Like the training package is really good but it just missed out IT altogether. You know very few dietitians will have come into this job having used Vision or EMIS before, and then we're expected to just learn how to use it. Like the written guidelines from Insight Solutions were just about running the search and how to complete the data entry template, they weren't you know how to triage the patients, where to look in Vision or EMIS to find the information you're looking for, you know, no basics for how to use Vision or EMIS." [HCP]

5.5.6 Leadership

Despite the concerns about banding (Section 5.2.2.3) the HCSWs were motivated in their roles. When discussing their roles, it was clear that they found value in their work and that they were motivated by the peer relations within the team, the national AWDPP dietetic lead and local Lead Dietitians, and a belief in the benefits of the programme for service users.

Teams described leadership to facilitate implementation of the AWDPP as consisting of supportive mentorship that led to trusting relationships among the delivery team. Whilst there were several challenges for the local delivery teams there was generally a feeling of being able to ask for support and resources, and an openness to talk about concerns and doubts promoted by the Lead Dietitians and the AWDPP national dietetic lead.

Colleagues were highlighted by all HCSWs interviewed as having been supportive and especially helpful in understanding the role and tasks where two or more had commenced their roles at a similar time. It was felt that as the programme and roles were new there was a lot to learn for both the HCSWs and their Lead Dietitian and having someone else to work with was essential in navigating the training, systems and clinic set up.

They're [team and manager] so supportive, so helpful, always there." [HCP]

5.5.7 Relationships

The level of engagement of stakeholders, including GP Staff, facilitated the successful implementation of the AWDPP. The local delivery teams discussed the impact of these relationships where they were established, and strategies they had developed to ensure these relationships were initiated and maintained.

"So my manager had worked with her [GP practice manager] before, so they already had that relationship, … But, we leaned on them to start with, the initial surgery and then not so much then setting up in other surgeries." [HCP]

"[GP relationships are] a little bit hit and miss as well. I'd say some surgeries are better than others, …we've had a really good response, so I don't know whether it's got something to do with the timeframe that I sent the letters out initially, so they had the letter warning them about the fact they've been picked up with these raised blood sugars. And a lot phoned us, and they reached out to us to make that appointment. So I think they put something on their Facebook page, just to say this is a new service and you may be contacted." [HCP]

"I've only done [x] Medical Practice at the moment but they're super friendly. I mean the first time we went there they were like, yeah, you can have the room, if you need any support, get IT support. They're really, really friendly. Even as the patients come in, you can find it on the system, so you don't have to go out and call them, but also sometimes if you need help, you can just go down and ask the receptionist, very friendly …hopefully it stays that way for other you know five GPs." [HCP]

5.6 Understanding the Mechanism of Impact

5.6.1 Exploring the causal mechanisms of the intervention

At this early formative stage, we undertook a detailed examination of the progress of the AWDPP against its proposed Theory of Change set out in the AWDPP logic model. With the mechanisms of change / impact in the AWDPP not explicitly stated we have interpreted based on the COM-B determinants of behaviour in relation to the resources (the AWDPP components), activities, outcomes and impact described in the AWDPP Theory of Change. The theoretical domains framework (TDF) is a theoretical framework that identifies key determinants of behaviour changes and was used to add detail to the Theory of Change review.

A detailed description of the mechanism of impact being examined is available on request from SABU with supporting evidence provided to present a rich description of each of our triangulated findings from the data. Where evidence is met, this enabled us to make a clear statement that the AWDPP is demonstrating progress against its Theory of Change, whereas where evidence is unclear this suggests some uncertainty in our findings. Where no evidence was found, this could potentially pose a risk to the AWDPP meeting its programme outcomes in according with the Theory of Change. We present this against three criteria as follows:

- Yes: We found evidence that the AWDPP is meeting or is on track against its Theory of Change.
- To some extent: There is preliminary evidence that the AWDPP is meeting the Theory of Change, but some uncertainty remains.
- No: No evidence was found or there is evidence the AWDPP was not currently showing progress in delivering against the Theory of Change.

Table 14 provides a brief summary of our review of the mechanisms of impact for the AWDPP against the Theory of Change.

Table 14: Brief Summary of the Evidence Found to Support the AWDPP Theory of Change.

AWDPP Component	Mechanism of impact	Evidence consistent with the AWDPP ToC
Health Professionals		
AWDPP team leads/line managers (national and local) support	AWDPP leads sharing of the programme purpose and aims which increase HCSW's belief in positive consequences for service users	To some extent
	Positive feedback about skills progression and support from AWDPP team improves self and professional confidence, commitment and expectancies about service user outcomes	Yes
Training in MI, Agored and specific AWDPP training	Access to the AWDPP training encourages development of the skills, abilities, independence, competence and behaviours	To some extent
	The training provided increases understanding of the pre-diabetes risk and rationale for the AWDPP along with knowledge of AWDPP delivery	To some extent

	Knowledge of AWDPP increases the professional role, belief in consequences for service users, self and professional confidence	Yes
Standardised templates for GP systems set up and access	Having standardised tools, access to systems and joint training opportunities with practice managers increase successful service user identification, programme invitation and attendance	To some extent
	Joint working with practice managers and access to standardised tools improves the HCSWs confidence to undertake tasks related to service user identification, programme invitation and appointment booking	To some extent
Access to clinical support	Having clearly identified clinical staff that are available to support with concerns around eligibility for service users will improve HCSW decision making as they are supported to develop their skill, and this will increase confidence in ability to arrange appropriate invitations and appointment booking	Yes
	Knowing that there is clinical staff available to support with concerns around eligibility for service users will increase confidence in appropriate invitations and appointment booking	Yes
	Support and knowledge by AWDPP lead provide the HCSWs with the skills and confidence to appropriately escalate service users	Yes
	Having access to clinical staff who can answer questions of eligibility provide a feeling of social support to HCSWs which increase skills, abilities, and competence and encourages independence to appropriately escalate issues	Yes
Consultation space / IT capability / Equipment	Knowing how to obtain an appropriate location with IT access and the necessary equipment enable HCSWs to successfully deliver the AWDPP sessions	To some extent
	Having access to an appropriate location with IT access and the necessary equipment enable HCSWs to successfully deliver the AWDPP sessions	To some extent
AWDPP protocol and intervention design documents	Understanding what resources are needed for AWDPP delivery support HCSWs in identifying relevant tools for service users	Yes
Leaflets for sharing with service users DUK resources / Eatwell guide / Broader weight management documents	The information provided in the AWDPP protocol and related design documents, and external resources related to diabetes, nutrition and weight management enable HCSWs to identify what resources they need for AWDPP delivery	To some extent
Service Users		
AWDPP Invitation	The invitation letter or the telephone call from HCSW makes the service user aware of the AWDPP and the reason this service may benefit them	Yes

	Understanding there is an individual risk makes the service user feel that it would benefit them to attend the AWDPP appointment	Yes
AWDPP appointment	The service user is aware that an appointment has been made for them at a convenient time and at an accessible location	Yes
	The information, discussion and goal setting increase the service users understanding of personal risk for T2D and confidence in taking preventative action	To some extent
	Setting personal goals increase the service user's belief in own capabilities and that their goals can be achieved	To some extent
Signposting	The service user understand what service may best support them with healthy eating / weight management, is aware of relevant local services that will support their preventative actions and believe that access is available	To some extent
	The service user feels confident to attend the signposted service as the AWDPP appointment has increased their knowledge of T2D and prevention	To some extent
	The service user believes that the signposted service will support them in improving their skills and ability to achieve their agreed goals around healthy eating / physical activity and reduce their risk of T2D	To some extent

5.6.2 Exploring participants' experiences and actions following the intervention

Whilst service user outcomes were not a focus of the formative process evaluation, to assess the Theory of Change, this was explored within the context of their experience and actions taken as a consequence of attending the AWDPP appointment, with experience further presented as part of the personal value of the AWDPP (see section 5.7.2)

The delivery team interviews referred to the opportunities:

"Another thing we do at the end of the session is some of the referrals, so we offer a one to one with dietitians or some people might prefer to do within the groups, so we do offer group session, and then obviously you have the exercise referral scheme as well, NERS, which is something we can offer too. Some of them obviously will say no to that, but then we also say that we have access to internet, you have My Desmond, which is basically what we talk about but a bit more in-depth, so they have that, so they can do it at their own time. Some of them, they do have limited mobility in terms of physical activity, so we signpost them to some … website to do chair exercises. And the other one I do tend to signpost is Diabetes UK to get more information, and like I say it's evidence based, it's not something they've got to do which is really important." [HCP]

From the Service User Survey respondents reported that a variety of information leaflets were disseminated before or during the appointment and three quarters (n=87, 75%) of service users found these leaflets either very or extremely useful.

Sixty (52%) service users reported they knew they were at risk of developing T2DM before being contacted about the AWDPP. The majority (n=101, 87%) said they understood their own risk factors for T2DM and 81 (70%) stated they were either very or extremely confident about making lifestyle changes. Sixty-one (53%) service users reported they had been offered

additional support such as referral to weight management services or NERS. Over half were planning to take up the referral, however some were unable to due to barriers such as caring responsibilities, work commitments, physical abilities, and lack of motivation.

All the service users interviewed set personal goals to make lifestyle changes such as increasing their exercise levels, making changes to their diet, or reducing their portion sizes, as part of their AWDPP appointment. For some people, being made aware they were at higher risk of developing T2DM via the invitation letter was enough to motivate them to start making changes and they joined a gym or weight loss group in the weeks preceding the AWDPP appointment.

"I … set … not goals, realistic achievements I suppose that I could do to help…. I'm eating slightly healthier and still continuing with my exercises." [Service User]

"I had already started addressing my diet and exercise as soon as I had received the written appointment." [Service User]

There were limited opportunities in the evaluation to review capability. However, it was acknowledged that making and maintaining lifestyle changes would not necessarily be easy and regular follow up would be important to keep people motivated.

"I'm not unaware of nutrition and exercise and everything like that, it's more my mindset of actually making myself get on and do it sometimes." [Service User]

"I think even perhaps a three month prod, not to see me but just perhaps a call or a letter to say how's it going… because otherwise you're just going to fall off the wagon again" [Service User]

Overall, service users were unsure when and how they would be contacted for a follow up appointment, but all assumed there would be one. Service users felt it to be a flaw in the programme if there was not an automatic recall system in place to repeat the HbA1c blood test and feedback to people whether they were still at higher risk of developing T2DM or whether the improvements they had made had reduced their risk. Many service users assumed they would have to remember to book another blood test but weren't quite sure whether that would be acceptable to their practice.

"The onus I gather is on us to remember to book a blood test… I don't know how it works with the GP surgeries… I don't know if they're going to be receptive to you having another blood test… people just won't remember to make an appointment to have their sugars checked, and because they think they're not going to be checked up on for a year, it's like mm, I don't need to do anything for now" [Service User]

From the service user interviews and the Service User Database it was also found that whether people were offered referral to other support services such as the National Exercise Referral Scheme (NERS) varied. This may have been due to the availability of local services or tailoring to the needs of the individual service user. Some service users were very welcoming of the offer of additional support whilst others were either already active or did not wish to go to the gym. There was similar variation in the response to referral to weight management services with some already attending a group. The socioeconomic status of service users was not known in full but a large proportion of those identified (48% in quintile 1 of the WIMD) lived in high deprivation areas, and as such may have limited opportunity to engage with signposted activities with any cost expectations.

5.7 Assessing the Value of the AWDPP Programme

In order to undertake this work package, we needed both qualitative and quantitative data. Our exploratory CCA for this evaluation was dependent on the data. Based on our CCA we also intended to look ahead to assess what data would be required for fuller economic evaluation of the roll-out of the AWDPP and consider how collecting data for value-based assessments might continue over time. We therefore first examined the data requirements for an economic assessment in the context of our formative findings.

We then explored what matters to service users (patient value). We then investigated short-term economic outcomes (technical value) and contextualised our quantitative evidence with the qualitative findings to understand the value of the AWDPP intervention and delivery. Finally, we present an integrated summary of our findings to assess the value of the AWDPP intervention in line with Wales prudent health principles.

5.7.1 Data requirements for an economic assessment on value-based care

Our formative findings (summarised in Table 15) indicate that it is feasible to capture and summarise the resource use, costs and outcomes that could be beneficial to establish the economic value of the AWDPP intervention to NHS Wales. However, based on our findings, we suggest a number of lessons from this formative assessment to guide future analysis [17].

Table 15: Undertaking a Value-Based Assessment: Feasibility Assessment.

Criterion	Evaluation findings	Actions proposed to facilitate a full economic evaluation
Establishing economic outcomes of importance/relevance to inform a health economic analysis	Not possible at this stage to build a comparative cost consequence or cost effectiveness analysis. We have undertaken cross sectional costs and consequences estimation for the AWDPP recipients. The results presented summarise costs and consequences data on people who have been identified and have received the AWDPP intervention. No comparator data available.	Service users will require follow-up. 12 month follow up HbA1c level is crucial to facilitate health outcomes to be measured. Need to establish whether service users receiving intervention are less likely to develop diabetes and be compared with a population without AWDPP. Inclusion of at least two data collection points (and ideally a baseline measure before the AWDPP intervention) to establish how the intervention is working. A model-based analysis could be conducted to simulate a comparator population if not collected. Alternatively, we could compare to areas which have not had intervention rolled out but would require data in order to compare.
Data availability: Equity and access to AWDPP	Disability and ethnicity data were unavailable due to incomplete data in primary care and data privacy concerns using data from the	If data were collected on these characteristics, we would suggest the potential to include a distributional cost-effectiveness analysis (DCEA) to address equity concerns alongside efficiency.

	Service User Database. No analysis could be conducted on these themes.	
Access and applicability to calculate AWDPP intervention implementation costs	Individual level data on the AWDPP delivery length of session and associated administration time. Results have been evaluated based on a per protocol/average delivery of AWDPP triangulated with the experience noted by HCSWs and Lead Dietitians in the qualitative data. No information was available on whether additional resources were required – all costs based on protocol-based staff time only.	Undertake validation of delivery and administrative time for AWDPP delivery. Investigate the requirement for no cost/GP practice NHS premises versus non-NHS premises required for intervention and follow up delivery to assess the full cost of delivery.
Access and applicability to capturing participant level health resource use data	Resource use was only established for intervention delivery. There were no data related to ongoing service user resource use or use of support services.	Estimate the resources and costs of uptake of support services which are accessed as a direct result of the AWDPP intervention. Use of wider participant level health data e.g., GP or practice nurse appointments related to diabetes after the AWDPP intervention. This may be possible to be captured within linked datasets.
Access and applicability of capturing participant health related quality of life level benefits (EQ-5D 5L)	Using the EQ5D 5L we have been able to establish whether there are differences in HRQoL/utility amongst those receiving the intervention. Data are not available for those who were excluded or declined the invitation. Some anecdotal evidence of the EQ5D 5L not being completed in sessions but data shows that this was completed in majority of cases.	Suitably long timeline to be able to collect two EQ-5D 5L data points to calculate QALYs as well as a baseline assessment. This could be captured as part of the pre-appointment information sent. Further examination on how to practically collect PROM and PREM data for the AWDPP intervention warrants further discussion and suggest that engaging with the Directors of Value-based Health Care (VBHC) in Health Board and National Clinical Director for VBHC.

Through the iterative process taken in the design of our data collection methods and tools in collaboration with the AWDPP programme team we were able to conduct an early-stage assessment, generate a 'wish list' of resource use and outcomes data and their sources and potential availability, plus learn lessons that can inform the progression of this evaluation towards the design and delivery of a future complete economic analysis as part of an summative process and outcome evaluation in the future. This will, given the nature of this

important public health programme, inevitably will need to be executed using economic modelling approaches.

5.7.2 What matters to service users: Service user (patient) value

Our survey findings indicate that the AWDPP intervention was highly valued by service users in providing an appointment tailored to their own personal needs. As evidenced from the 116 service users who returned a survey, 100% said they were satisfied with the location of their appointment and the vast majority (99%) indicated they were able to have their appointment at a satisfactory time for them. This finding was consistent with our qualitative interviews with all interviewees stating the AWDPP was convenient and accessible.

One interviewee felt the opportunity to attend the appointment was sufficiently important to emphasise the need for wider awareness of the impact of diabetes and that understanding the potential consequences of progressing to have diabetes was important.

"I don't think diabetes is taken as seriously as it should be, is it really?.... But I do think people need to be made aware of the consequences". [Service User]

The free text responses to our survey of AWDPP service users (Table 16) showed a consensus amongst service users regarding the value of AWDPP as a preventative intervention to mitigate health problems.

Table 16: Free Text Responses Recorded Within the Service User Survey

Reasons to attend appointment	Number of responses	Example responses
To gain knowledge of how to prevent T2DM	38	*To gain information about preventing progression into diabetes by diet and lifestyle changes and to work out which areas could be improved upon.* *To gain advice and information about type 2 diabetes and what I can do to prevent the need for medical intervention in the future.* *I felt that there may be more I could learn about preventing or reducing my risk of diabetes.* *I want to prevent getting diabetes. I have enough health problems. Prevention is better than cure.*
Concern about current risk of developing T2DM	24	*A high, and unexpected as far as I was concerned, reading in a glucose test had alarmed me and I was keen to discuss what I should do about it.* *I was shocked to receive a letter informing me that I was borderline diabetic so felt it was important to find out more about it all.* *Because I wanted to find out if I had diabetes and if not, what I can do about it.* *Horror in finding out I could get type 2 diabetes as my own doctor's surgery who took the blood samples did not inform*

		me my blood sugars were up. Sample was taken in July. My appointment with your team was November.
General health	25	*I realised I had to change my eating habits which I have started but needed more guidance about food and exercises.* *I'm just so worried about my health. I have just come to have more advice.* *Big believer in prevention of illnesses. Should be more.* *I want to be fit and well. Need to be shown the complete healthy way I should be eating the correct things*
Advised to attend by health care professional	10	*The importance of the subject and the fact the NHS were being proactive.* *Recommended and organised by my GP.*
Family history of T2DM	6	*My mum had type 2 diabetes in her early sixties and I don't want to go the same as she did …think it is important.* *I have diabetes in the family but at the moment I'm OK.*
Opportunity to have a face-to-face appointment with a health care professional	4	*I thought face-to-face was preferable. Video or phone leaves a lot to be desired. Personal contact is more satisfactory. You can learn other things seeing the face of the nurse.*

Interestingly, in our qualitative data derived from the interviews, the majority of the eight respondents talked about not having prior expectations of what would happen at the appointment. Whilst it is difficult to draw conclusions from this small and potentially under-representative sample, as indicated by one of our interviewees there may be an underlying issue driving lack of uptake by people who are overweight (supported by the data we had on those who declined to attend (Table 11).

"When I phoned and made my appointment, I said the only way(!), the only way that I would go is if they didn't weigh me." [Service User]

The lack of complete data held in the routine datasets allowing equity considerations to be assessed, investigating how the AWDPP is promoting the principles of equality, diversity and inclusion warrants further exploration in future evaluations. However, considering our analysis of the data we do have access to, it is particularly concerning because of the lower uptake of people in deprived households and with higher BMI.

The value of the AWDPP information and advice was highlighted in responses with 95% (n=110) stating the information was right for their own personal needs. The value of the AWDPP in raising awareness of the risk of developing T2DM was indicated by just over half of respondents (52%, n=60) in both the survey data and the interviews with respondents indicating they knew of their personal risk of developing T2DM before the AWDPP appointment. However, in 48% (n=43) of the service users responding to the survey, individuals were not aware of this risk beforehand. Translating this knowledge into potential behaviour change is possible: 88% (n=101) said it would be very or extremely important to make changes; with 70% (n=81) stating they would now be very or extremely confident in making these changes advocated by the AWDPP into their personal lives. These findings are supported by the qualitative interviews where all interviewees set personal goals, with the awareness of their risk of developing T2DM a strong motivation to make changes.

One potential equity challenge for the AWDPP is the signposting to additional services with 53% (n=61) of service users stating they had been offered additional support. Exploration of our qualitative and quantitative data (Table 8) suggests some variation in referral to support services being offered and given the potential for this to be either related to local variation (e.g., availability of local services) or personal need (e.g., tailoring to the personal user).

There was overwhelming consensus from our survey of service users (89%, n=103) that the AWDPP intervention was very or extremely useful, with the same consensus that the AWDPP could not be improved. Of the 10% (n=11) who said it could improve, this relates to minor modifications around follow-up, signposting and giving additional information around nutrition.

In summary, our findings indicate that from the voice and opinions expressed by service users who took part in the survey and/or interview, the AWDPP matters to them; raising awareness, promoting knowledge and capacity to change behaviours and motivate and raise confidence in those identified at risk of T2DM. Whilst it is premature to make any indication as to how this translates into longer term patient reported outcomes, the experience of the AWDPP for those who took part in the evaluation fulfils personal value as a model of preventative health aimed at reducing risk of T2DM.

5.7.3 Technical values: Resources and costs associated with delivering the AWDPP intervention

Identification of the resources and their costs utilised in delivery of the AWDPP in the Wave 1 roll-out has included both the staff and non-staff resources required to set-up and to deliver the intervention. Characterisation of the resources utilised were developed from the AWDPP protocol. The resources and costs associated with the implementation and delivery of AWDPP were split into four main categories: staff training, support by dietitian, identifying recipients and intervention delivery. The stakeholders' perspective of the AWDPP programme provides important context to understanding the AWDPP in the short-term and enriching the value of the AWDPP for the NHS and service users. Our qualitative research supplements the quantitative findings to contextualise the resources and costs and give some indication as to how far they vary (or not) from the protocol.

5.7.3.1 Health Care Support Worker training to deliver the AWDPP intervention

HCSWs are required to complete various training sessions to gain the skills and knowledge required to deliver the AWDPP intervention. Training is primarily delivered by dietitians (undertaken both by the dietitian responsible, overall, for the AWDPP and the local Health Board based dietitian responsible for the programme). The HCSW also had to attend specific training courses that are not solely restricted to HCSW for the AWDPP, to give them relevant knowledge and understanding e.g., nutrition skills. Each HCSW also attended motivational interviewing training which was made available specifically for the AWDPP and was enabled through the Welsh Government funds.

To obtain a training cost per HCSW, the training and trainer costs were estimated as absorbed costs based on the typical number of attendees in each training session, not just the AWDPP HCSW, including those not being trained specifically for AWDPP. Absorption costing includes all of the costs associated with producing a product or providing a service, the total cost of a product or service is absorbed, or spread out, over the units produced. This is a one-off cost and does not take account of any further training the HCSW might undertake as the AWDPP continues.

Full details of how we put together the resources and costs from the protocol associated with training are presented in Table 17 and summary of the costs in Table 18. The total cost to train each HCSW involved in AWDPP is estimated at £2,496, including £1,848 of directly incurred HCSW time, and £628 of the full cost of the NHS staff (e.g., dietitian) costs for delivering training.

Table 17: AWDDP Training: HCSW Training costs

Task	Hours	Training delivered by	Cost per hr (£) [28]	Cost (£)	Basis of training	Absorbed Cost (£)
Trainer Costs						
Agored Level 2 Community Food & Nutrition	10	Dietitian (Band 7)	65	650	10:1	65
AWDPP Training delivered by national dietetic lead (small group)	6	Dietitian (Band 8a)	75	450	5:1	90
Vision/EMIS Training	2	Dietitian (Band 7)	65	130	1:1	130
Motivational Interviewing (group)	12	MINT trainer (Band 6)	55	660	10:1	66
Observations	2	Dietitian (Band 5)	41	82	1:1	82
Specific populations	3	Dietitian (Band 7)	65	195	1:1	195
Total	**35**					**628**

Table 18: Summary of Staff Training Costs

Summary	£
Trainer Costs (Dietitians Band 8a and 7)	628
HCSW Training Hours	1,848
Accreditation Fee	20
Total Training cost per HCSW	**2,496**

In respect of the HCSW training, there is no suggestion from our qualitative research that the training time and our estimated costs laid out in Table 18 vary from the protocol. The training the HCSW experienced, and the delivery of the service was positive and suggests some positive spillover effects from the training which we cannot capture in a strictly quantitative analysis but will benefit NHS Wales and the population it supports, which complement the findings already reported in section 5.2.2.4.

"I've had loads of jobs over my years, and I've never had such thorough training as I've had coming into here. Most of it was on-line, you know, I was just learning about diabetes and pre-diabetes. I've had some really good motivational interviewing training, [main dietetic lead]'s been very on-hand with the video …. So I … I feel the most supported I've ever felt in any job I've ever … and I was really surprised how thorough the training was and I wasn't … You know I'm not … but I feel that I'm giving benefit and quality to the people that I see through what I've learnt and what I've been taught and applying it in the right way…" [HCP]

5.7.3.2 Delivery, support, co-ordination and quality assurance

In addition to the initial training provided by the dietitian there is ongoing support and on the ground training. This category therefore includes all support, quality assurance and co-ordination supported by the Lead Dietitian responsible for overseeing the delivery of the AWDPP intervention within the Health Board and clusters and providing regular support and mentoring to HCSWs delivering the intervention. To accommodate these activities, based on the protocol, it was assumed that each cluster incurs the cost of 0.25 FTE Health Board based dietitian (Band 7) costs per month from the start of the AWDPP implementation.

We observed, in the data and through the qualitative research, the unexpected greater use of dietitian time and related costs - partly due to the effort required to get the AWDPP under way, IT (learning the systems and access) plus identification of people eligible for the AWDPP intervention and partly because of the difficulties in recruiting and retaining the HCSW, with the Lead Dietitians filling in the gaps.

"I'm funded for two and a half days, but I've basically been doing it full-time since I started. And if I had stuck to two and a half days, I don't know, I don't think I'd be here now!" [HCP]

"…. time for this post, it's been all consuming. Fortunately, I've got another part of my job that is a bit more flexible, and I've been able to use some of those hours for the AWDPP" [HCP]

"…we've had to cut back on some of the clinics that we're running because I physically can't be in every clinic with every support worker" [HCP]

The additional time spent by the dietitians supporting the HCSWs is likely to reduce as the HCSWs settle into their roles and become more experienced and as subsequent waves of roll-outs continue and the dietitians move up the 'operationalisation and delivery' learning curve as they bring more HCSWs into the delivery of AWDPP.

5.7.3.3 Identifying recipients and other AWDPP appointment preparations

The protocol assumes the identification of people eligible for the AWDPP intervention takes place, in partnership with and, at the GP practice and is undertaken by the HCSW responsible for delivery of the intervention locally. The protocol for the AWDPP specifies how to identify people eligible to receive the AWDPP intervention using General Practice records and meet the inclusion criteria using the records. These lists are reviewed internally by the HCSW and finally by the Lead Dietitian. Invitation to participate letters are sent once the person has been identified and two follow up phone calls made to people who have not answered the letter.

We have calculated the resources and costs of identification according to the protocol and assumed it is all accommodated within the 30 minutes of admin time. This has been an underestimate in some cases. As documented elsewhere (Section 5.4), there have been issues with identifying eligible participants and we have not been able to obtain estimates of the extra time used as the access to patient records has varied across clusters and which were ultimately resolved using Lead Dietitian time or developing cumbersome workarounds. We have retained 30 minutes in our estimates as we assume the IT issues will be resolved now they have been identified.

Invitation to participate letters are sent once the person has been identified and two follow up phone calls made to people who have not answered the letter. Table 19 and 20 below summarise the resource estimates.

Table 19: Identification of Eligible AWDPP Participants

Task	Resource	Unit Cost (£) [28]	Time (hours)	Cost (£)
Identify people with raised HbA1c	HCSW (Band 3)	33	0.5	16.5
Select eligible people	HCSW (Band 3)	33	0.5	16.5
Review List	Dietitian	75	1	75
Total				**108**

Table 20: Resources and Costs of Engaging with Eligible AWDPP Participants.

Task	Resource used	Unit cost per hour	Time (hours)	Total Cost
Invitation Letters	Stamps, posting, envelopes			£1.05[29]
Telephone	HCSW (Band 3)	33[28]	0.167	£ 5.50
Reminder	HCSW (Band 3)	33[28]	0.017	£ 0.55

However, when reviewing our estimates, it is wise to bear in mind the impact of the extra time.

"…so that was more for me was the admin side of things … And then the other area which has been a problem for us all is the Vision and EMIS, which is when we actually go into the surgeries and pull the data, which is still a little bit problematic to be honest! … it was quite a lot at first to kind of go in, find the data, then start going through it all and … and then doing our actual role." [HCP]

5.7.4 Delivery of the intervention

The AWDPP intervention is delivered to each service user in a 30 minute session by the HCSW, in line with the AWDPP protocol. Alongside each appointment the HCSW needs to take an additional 30 minutes per appointment for administrative activities (e.g., making referrals, writing up notes). The qualitative data from the HCRW interviews suggested that the 30 minutes time for the AWDPP intervention works well.

"And obviously then the resources that we have, just to show them you know how our body works, you know the ranges for their blood glucose … if they came face-to-face I would give them a handout and to take them home. But then similarly on the other hand, if you have someone that doesn't talk very much, …you know it depends on the patient. But I think thirty minutes for the majority of the time is OK". [HCP]

"I actually find the timing works quite well, I was surprised, that was one thing I was kind of concerned about. I haven't had to limit it to thirty minutes though yet, because of the way that patient slots have been booked so far, like a lot of patients are not showing up - several DNAs that means that I actually haven't had to be very rigid with my timings. So … but I have actually roughly managed to meet thirty minutes when I kind of have been able to do that. But I think any less would be actually quite difficult. Yeah." [HCP]

Leaflets with supporting information are available for the service users so provision for these at £0.05 per appointment was included for leaflets and materials provided to the service user at the AWDPP session. No provision for HbA1c testing has been included for the initial session delivery as the HbA1c test results were already in the patient record having been taken routinely prior to the AWDPP intervention. It is assumed that at 12-months the service user is followed-up according to the protocol with a second HbA1c test, plus a HCSW appointment to

facilitate a discussion with the AWDPP service user. Table 21 below summarises the resources and costs associated with the delivery of the AWDPP.

Table 21: Resources and Costs of the AWDPP Appointment.

	Initial appointment		Follow up at 12-months	
	Resource and unit cost	**Total cost**	**Resource and unit cost**	**Total cost**
Delivered by:	HCSW		HCSW	
Cost per hour	£33.00[28]		£33.00[28]	
Length of Session (Hours)	0.50	£16.50	0.50	£16.50
Session Admin (hours)	0.50	£16.50	0.50	£16.50
Phlebotomy Cost	£0	£0.00	1	£4.75[30]
HbA1c Tests	0		1	
Laboratory test cost	£0	£0.00	£1.85	£1.85[30]
Leaflets	1.00	£0.05	0	£0.00
Cost per appointment		**£33.05**		**£39.60**

The full costs of the HbA1c test and lab fees at National rates are included for completeness. In practice these may not be charged at this rate or at all.

5.7.5 Total cost for the AWDPP intervention: roll-out of Wave 1

For each Health Board in Wales participating in AWDPP the costs of providing the intervention were estimated based on the number of people both identified as eligible, invited to attend an appointment and those attending an appointment. There is inevitable attrition between those invited and those attending, and these figures are presented separately in Table 22.

Putting the four elements of the cost together, based on the information we have gathered to date, we were able to calculate the total cost of delivering the implementation and delivery of the AWDPP, from June 2022 to December 2022 (Table 22).

Table 22: Total Cost of Delivering AWDPP in the Set Up and Roll-Out Period (June to December 2022)

Health Board	Total sessions delivered	Sessions Delivered inc. DNA's	Total cost for initial appointment (£)	Total cost including a follow up appointment (£)
Aneurin Bevan UHB	179	202	47,194	54,283
Betsi Cadwaladr UHB	50	53	23,236	25,216
Cardiff and Vale UHB	317	347	57,179	69,732
Cwm Taf Morgannwg UHB	32	35	21,493	22,760
Hywel Dda UHB	0	0	0	0
Powys THB	90	93	31,474	35,038
Swansea Bay UHB	133	146	37,682	42,948
Total Wales	**801**	**876**	**218,258**	**249,978**

Based on the available information on activity up to Dec 2022, the AWDPP has cost £218,225, with an estimated all-inclusive cost to enable one person to attend an AWDPP appointment of

£272. The AWDPP protocol requires service users to receive a follow-up HbA1c and an appointment at 12-months post-intervention. Including these costs into our estimates, the All Wales total cost increased to £249,978, with an estimated cost per session delivered in Wave 1 of the roll-out of the AWDPP of £312.

There were unquantifiable resources associated with the delivery; for example, GP practice time and support varied greatly and is still a 'work in progress'. There were also potentially beneficial (but unquantifiable) aspects for the GP practice in collaborating with the AWDPP team.

"… like my last clinic last week, I had one of the practice nurses from [x] sitting in, because she wanted a bit more information to see what we actually talk about, so she didn't know what she was sort of sending patients to [x] …. So hopefully that's improving relationships a bit and they can kind of get the ball rolling before they [patients] come to see us too." [HCP]

We know from our data analyses (Table 8) that a proportion of service users are referred onwards to participate in NERS or other support programmes and these costs are not factored into our estimates as we do not have the numbers of people who completed the programmes or the costs of the programmes. These services are also provided to a wide range of people with other needs for this type of support, not just AWDPP service users. Our qualitative data suggest the rate and volume of referrals has caused problems for the services. Some investigation into the need for further investment and expansion of these services might be necessary as the AWDPP rolls out more widely and then reaches 'steady state'.

"…. like we've provided funding for extra members of staff in NERS, if you suddenly increased the numbers … NERS can't take everybody" [HCP]

To determine where the resources and costs in AWDPP delivery are mainly incurred, we were able to access data for the longest running AWDPP service (Cardiff and Vale University Health Board) which had the highest number of service users recorded by end of December 2022. This exploration reflects the reality of delivery rather than the protocol-based resources and costs we have used to estimate the cost of delivering the AWDPP intervention; this is equivalent to providing a 'intent to treat' analysis as part of providing a pragmatic understanding of the resources and costs of the AWDPP during this early phase of programme delivery, and where variation in care may help to explain findings to date.

The support provided by the dietitians was the greatest cost to the Wave 1 roll-out of the AWDPP. Our findings were triangulated with our qualitative findings and the service user data. In Cardiff and Vale University Health Board the Lead Dietitians' time accounted for around 65% of the total cost of the delivery of the intervention. This included the time involved in set-up and implementation of Wave 1. It is notable that in Cardiff and Vale University Health Board that the Lead Dietitian began work on AWDPP in April 2022, with the first clinics starting in July 2022. Some of these extra costs were incurred in part because the dietitian spent time in establishing and delivering the AWDPP because of the difficulties in recruiting the Band 3 HCSW and accessing service user data on GP systems.

These findings are supported by the qualitative data from Lead Dietitians in other Health Boards. The dietitian time and costs also account for the highest proportion of costs for other Health Boards, although the delivery of the AWDPP was in earlier stages of implementation in these Health Boards. The number and cost of appointments taken up by service users account for 20 percent of the total cost, even including 12-month follow-up sessions which have yet to take place.

Whilst presenting our quantitative findings of the technical value of the AWDPP is necessary, it is not sufficient for understanding the value associated with enabling the delivery of the

AWDPP intervention across local contexts and time scales. We used other quantitative and qualitative data collected to understand and contextualise the main drivers of resource use and costs in these early stages of implementing the AWDPP intervention. Complementing to findings already presented under policy contextual factors (Section 5.5.1), we further explored this in relation to the economic value of AWDPP.

5.7.6 Managing the AWDPP grant budget and drivers of resource utilisation

The Welsh Government provided financial support of nearly £3 million for the roll-out of the AWDPP split over the three financial years (2022 – 2025). The funding comes from the Healthy Weight, Healthy Wales programme in Welsh Government.

The funding was not based on a detailed bottom-up costing, designed to get specific numbers of clusters up and running in each Health Board. Rather, the funding was intended, it seems, as a contribution to the programme to provide 'pump priming' – to get the programme developed, rolled out and implemented in the Health Boards starting with Wave 1 with 'pilot' clusters. Whilst this approach created some issues regarding who got what, how and when, it was crucial to enabling the AWDPP to be developed and delivered.

It was evident to the interviewed stakeholders that without this funding the delivery of any form of national, cohesive diabetes prevention programme across all the Health Boards would have been inequitable and inconsistent in terms of the geography, the population served, the nature of the intervention and supporting programme.

"…so I think all this like layer of preventative work is, is really key. And it'll save costs in the future. Surely this sort of work is value added, value adding work?" [HCP]

'Yeah, it is multiple, so patients first of all, to reduce their risk of progressing on to type 2 diabetes, that's the whole aim of this. But also every single service should benefit because we know that people living with type 2 diabetes are a great resource drain on both primary and secondary care, in terms of the intervention that's required, prescribing, number of appointments and then development of complications potentially requiring secondary care intervention. So there'll be benefits across, you know, across both for our patients in the community but also for primary and secondary care in terms of resource implications'[HCP]

However, not only was funding essential for initiation of the programme, stakeholders felt that the grant funding was essential longer term and had fears about sustainability without it, due to competing pressures driven by the need to provide acute services. They were concerned that when the budget finished, the AWDPP would not continue to be funded by the Health Boards as resources are likely to be directed into more acute areas, and for some of our interviewees it was seen as a potentially inequitable situation.

"What I do not want to see is that Health Boards are asked to fund this themselves at a Health Board level because my concern is that because of the financial strife in which some Health Boards find themselves, they will not be able to offer the entirety of the programme or will decide not to, at a Health Board level, and in my opinion, that is unacceptable." [HCP]

The speed at which the AWDPP intervention had to be refined, the pace at which engagement with the Health Boards had to be undertaken and the pace of the roll-out of Wave 1 inevitably caused challenges. There was confusion within the Health Boards about operationalising the financing, the agreed amounts and mechanism of financing. Nonetheless a way was found through the confusion, but our stakeholders suggest that the Health Board finance contact is a key stakeholder to engage early in the roll-outs.

"Yeah, just I think simplifying all of that …. I think it's quite important to make sure you've got a finance contact already like as a starting point, … involved from the beginning, I think it would have been a lot slicker the, the, the way it was. You know, we wouldn't have had all the messing around with who was actually funding this and how we were claiming back and all of that and we would have got been able to say, right, we've got this amount of money, what are we going to do with it? Who we can recruit, we could have had this discussion earlier. So I think that's key. Getting a finance person or a dedicated finance person involved in the first place." [HCP]

The budget that was allocated to the Health Boards was (and is) intended to be spent locally at the discretion of the Health Board in a 'hands off' way, paying respect to the fact that the Health Board and the Health Board leads would understand how best to deploy the funding locally to best effect. The approach to the roll-out ranges from those Health Boards who started with a relatively small base, using existing staff to start quickly, to those who chose to endure a significant delay in order to deliver a Health Board wide enhanced programme.

Whilst there is high value in allowing the Health Boards who know their population and the local needs best, this principle did not always work as well as intended with the freedom to operationalise the AWDPP having the unintended consequences at Health Board level. In differing ways, the HCSWs were graded differently, had either fixed term or permanent contracts and the Health Boards were employing the lead dietitians on differing contracts.

From the perspective of those involved in budget management, the lengthy recruitment process and other challenges where HCSW were being recruited *de novo* meant that there was slippage in the budget and considerable underspend.

With each expansion of the programme these 'initiation' resources will be incurred, and the resources and costs incurred in Wave 1 could be considered and in future factored in so that the management of provision of the AWDPP can be absorbed into 'usual care'.

From the accounting and finance perspective the management of the budget our qualitative research tells a complex story: whilst the grant was responsible for making the delivery of the AWDPP possible, there were some issues related to managing the grant, which as we review them have the benefit of informing the next waves of roll-out and will increase the value of the AWDPP.

The delays to initiating the delivery of the AWDPP locally, budget slippage due to challenges in recruiting and retaining the HCSWs and unanticipated costs (e.g., offices for staff and availability of rooms in which to deliver the service) caused problems and ultimately, underspends being returned to Welsh Government at the end of the year and being unavailable to the service in the next financial year, despite the maturing roll-out and increasing delivery of the AWDPP intervention.

' So I think what we probably needed to do with hindsight is to be more realistic about how long it would take to get people up and running. And I think the areas that haven't recruited have like recruited and then someone's left, or they've had to advertise a few times or they were late advertising initially… this is where the challenge of short-term funding versus implementing a big national programme, you know, you actually probably would have put a five year timeline on this, and the timeframe for the evaluation is very short, considering the timing of people getting up and running. [HCP]

"… those sort of Band 3 dietetics support sort of workers, you don't find they stay in post very long. So then you've got slippage when they leave" [HCP]

Other financial and logistical challenges became evident as the roll-out plans progressed: finding offices and premises for the HCSWs to be accommodated and running the AWDPP from a range of non-NHS premises were two frequently occurring examples.

"'We've gone into more private accommodation which is payable. We have to pay a charge on it but actually … I think it was about £4000 worth of rent cost that we had to pay for this for this team" [HCP]

"Well, I … we haven't really had any sort of the GP surgeries giving us any rooms at all, we've kind of mentioned it to [lead dietitian] a couple of times, asking if she could ask them and she just sort of says no, they said no. So it kind of leaves us scrapping to try and find rooms elsewhere to be able to offer those face-to-face clinics." [HCP]

"No, so that's another issue we've had, the GP practices haven't been forthcoming in giving us room availability and saying that we can work in the GP practice. So at the moment, my base is [x] Hospital, we're looking at room availability for [x] Hospital, and I think [x] has a room out of [x]. So they're all you know the Health Board … you know premises. And that's been a real struggle, we're still struggling with it now to get rooms" [HCP]

"Yeah, it's a difficult one because the [x] Hospital especially, the parking's round the back, and for someone with limited mobility probably it's not the easiest place to get into. And I think we've been told in [x] that we're not allowed to use the official outpatient rooms as well." [HCP]

Looking forward to the period beyond the grant funding there seems to be concern about the sustainability of the service within the community of stakeholders that the AWDPP is competing with the considerable pressure on acute services in a context of rising costs and tight budgets.

In terms of the consequences of the AWDPP delivery we are not yet at the stage where we can observe a change in HbA1c. However, there is a high rate of attendance and evidence from the qualitative research that service users are willing to make changes in their lifestyle to address their risk factors. There are also high referral rates into services for weight management and exercise that are proven effective. These activities are necessary steps along the pathway to improving health outcomes for the service users.

5.7.7 Sustainability of the AWDPP

Our stakeholders identified the benefits of reducing HbA1c to normal levels for the group of people identified to be offered the AWDPP. Avoiding the long-term morbidity of having T2DM not only improves the health of those at risk but also reduces pressure on the NHS in Wales. However, the benefits will only be realised in the longer term (e.g., 5-25 years) and the funds are required now. Classical economic theory tells us that benefits in the future are not valued as much as benefits now and thus a discount rate is applied to reduce the value of the benefits in the future to that of the present day. This is the challenge for budget holders for prioritising the funding of the AWDPP. When the programme has matured and we see the HbA1c data from service users, then it is vital that modelling of these results is undertaken to estimate the benefits for service users and NHS Wales of implementing the AWDPP and ring-fencing funding as the other nations in the UK have done.

Looking forward, beyond the roll-out of the AWDPP within the grant period and widening the AWDPP to all primary care clusters in Wales to the stage at which it is anticipated that the AWDPP is part of usual care and embedded in the NHS, was a concern to a wide range of stakeholders who all recognised the value of the AWDPP. Some interviewees recognised that

there would be a significant payoff for the NHS and for people at risk of T2DM in reducing the prevalence of diabetes through this programme, improving quality of life, reducing morbidity and mortality and a system wide positive impact on resources, but that those benefits would be a long way off into the future and beyond the grant period.

"Yeah, it is multiple, so patients first of all, to reduce their risk of progressing on to type 2 diabetes, that's the whole aim of this. But also every single service should benefit because we know that people living with type 2 diabetes are a great resource drain on both primary and secondary care, in terms of the intervention that's required, prescribing, number of appointments and then development of complications potentially requiring secondary care intervention. So there'll be benefits across, you know, across both for our patients in the community but also for primary and secondary care in terms of resource implications." [HCP]

They recognised, however, that pressures now in the NHS meant that the AWDPP would not be delivered as an All Wales consistent programme without the ring-fenced budget provided by Welsh Government. They feared that when the budget finished, the AWDPP would not continue to be funded by the Health Boards as resources are likely to be divided into more acute areas, and for some of our interviewees it was seen as a potentially inequitable situation.

"..and I have potentially heard that it's going to be given to Health Boards to fund, rather than across Wales…..Of course, of course, Health Boards are struggling, you know of course they are and I would really … really, really(!) passionately want to see this nationally funded." [HCP]

Another concern for sustainability of the AWDPP refers back to the band level of the HCSW. (Section 5.2.2.3). Funding was for Band 3, but some Health Boards, for a variety of good reasons, recruited staff at Band 4. Whilst our interviewees varied in their opinion as to whether the role was a Band 3 or Band 4, they were unanimous in their concerns that a fixed term Band 3 HCSW to deliver the role was not conducive to sustainability of the programme. The training and investment specific to the AWDPP e.g., the funded motivational interviewing training given to the HCSW is lost when they move on to another higher band or permanent contract.

The GP survey gave the GPs in the clusters where the AWDPP was being delivered a voice and sustainability was an issue raised.

"Given the current sustainability issues, we need to look at ways of working so that this work is not pushed into the background while other more pressing acute issues are being prioritised." [HCP]

"Please continue it long term and ensure funding is allocated for it going forwards. ….. push the case that this work is extremely important and (for the bean counters) cost effective - thanks." [HCP]

5.7.8 Integration and synthesis: Assessment of the value of the AWDPP intervention in line with prudent health care principles

The AWDPP was designed and delivered with Prudent Healthcare principles as a guide. Prudent Healthcare is a strategy which aims to deliver health care which fits the needs and circumstances of service users and actively avoids ineffective care that is not to a service users' benefit.

The principles of Prudent Healthcare are:

1. Achieve health and well-being with the public, patients and professionals as equal partners through co-production.

2. Care for those with the greatest health need first, making the most effective use of all skills and resources.
3. Do only what is needed, no more, no less; and do no harm.
4. Reduce inappropriate variation using evidence-based practices consistently and transparently.

Prudent Healthcare puts people at the centre of decisions about their own health. Instead of clinicians making all the decisions about treatment, these are shared decisions between practitioner and patient – this is an important part of co-production.

The AWDPP is an exemplar of the **first principle** of Prudent Healthcare, giving people receiving the brief intervention and related support (e.g., NERS) the knowledge and power to address their high blood sugar, and the reasons for changing their lifestyle to reduce their risk of developing T2DM and improve their health and well-being.

"...we're not only enabling people to get the right support and right advice at a later point when it's a little bit too far down the line or it's really difficult to access." [HCP]

"...it's about how we can really support a wide aspect of population to get that support, get just that you know appropriate support and advice at the right time…" [HCP]

There is considerable support for the AWDPP in primary care, across all the Health Boards.

"For me, it's probably we're going to realise the benefits in years to come. I would you know, I see every day how stretched GPs are and how short we are of time and … you know if any … any of the time that they're taking up can be … is preventable, you know if the ailments that they're treating now is … are preventable, then I think you know we should make every effort we can now.." [HCP]

"..more secondary prevention because these individuals are already in a risk category, I guess. But yeah, ultimately, it's exactly that, isn't it, it's reducing the prevalence of diabetes across the Health Board area, and at an individual level obviously increasing life expectancy." [HCP]

"…ensuring that you know that the services are made accessible to all our different you know most vulnerable groups. And I know that we've been working on that in [home Health Board], and I guess that's important from the perspective of not widening you know the health inequalities." [HCP]

Co-production and finding the way to make the intervention effectively work for an individual is important. Placing the opportunity in people's hands to enable them to help themselves is fundamental to the AWDPP. Referral to NERS for example, is a valuable resource for many of the people who have received the intervention, and sometimes people just need to find what works for them whether for exercise or other areas of their life. One of our stakeholders joyfully described a 75-year-old man who at the end of the intervention decided to start golfing again as his way of getting active. However, the extra pressure on NERS and other services could potentially founder under pressure of the referrals and might need addressing.

"…discussions with [referral services] so challenging … challenging discussions just I think because … again, the timeline isn't perfect. So if we said, can you organise your services so that in twelve months' time you can receive this additional bonus of people who may be referred to you, I think that would have been better received than we're starting this now and suddenly people finding that they're getting increased referrals into a service because they've not had very much warning, they haven't got the resources to increase their capacity. So it's all … and then it gets threatening because you kind of think, well hang on a minute, you're just going to give me all of these referrals and I'm already really busy. So there's quite a lot of anxiety about the whole thing." [HCP]

The **second principle** of Prudent Healthcare encourages the most effective use of skills and resources. By providing the AWDPP intervention at an early stage in the pathway of diabetes care, considerable NHS resources can be released in the future, saving millions of pounds by avoiding considerable morbidity and mortality associated with diabetes.

GPs and dietitians are highly trained and scarce resource: in the context of the AWDPP training up the HCSW to undertake a brief intervention, support people who participate by co-producing their plan for addressing the diabetes risk, plus signposting the person to other resources that are relevant and useful, is in perfect alignment with Prudent Healthcare. When 'more' is needed then the pathway is there to escalate referrals to a dietitian or GP.

"So it helps primary care to focus on the things that we can do, while enabling... you know...this to be done somewhere else." [HCP]

"So if we're talking about the full spectrum of roles, and people being able to directly access our skillset to support them, so that's sort of you know very much in line with the primary care model for Wales and a healthier Wales, right skillset, right place, right time, you know much more directly accessible, much more multi professional working." [HCP]

By providing the AWDPP brief intervention at an early stage in the pathway to diabetes the **third principle** is supported by doing only what is needed, no more, no less.

"Yeah, it is multiple, so patients first of all, to reduce their risk of progressing on to type 2 diabetes, that's the whole aim of this. But also every single service should benefit because we know that people living with type 2 diabetes are a great resource drain on both primary and secondary care, in terms of the intervention that's required, prescribing, number of appointments and then development of complications potentially requiring secondary care intervention. So there'll be benefits across, you know, across both for our patients in the community but also for primary and secondary care in terms of resource implications". [HCP]

However, in trying to optimise the contact between the HCSW and the person who is at risk of T2DM, there may be a tendency to try and do too much in the 30 minutes – more than only what is needed.

"So if we want to do the behavioural intervention but … and also understand the lifestyle and move … you know make recommendations on where they need to go and work with the national exercise referral scheme, we felt we needed an extra fifteen minutes….because they [health and wellbeing facilitator] will also deliver programmes, like Food Wise for Life, which is not happening for the all Wales." [HCP]

The **fourth principle**, reducing inappropriate variation using evidence-based practices consistently and transparently is upheld by rolling out a programme across all Health Boards in Wales.

"I think if there wasn't that pot of money from Welsh Government to do this, we would just continue to have an inconsistent diabetes prevention service, going forwards I think we need a standardised system in practices of who they should test, how they test and then an escalation route, so you're reducing the variation, and then this [intervention] would come in at that point." [HCP]

"I have been very pleased to see high uptake rates and that's been delightful to see, higher certainly that you would expect … higher than they had in for example the English DPP, and I think that's to do

with the one to one type intervention, so that because they're being rung and the intervention discussed with them over the telephone for patients." [HCP]

"So that longer term expectation in the next two, three, four years, is that actually every patient across Wales who's eligible and appropriate to have access to this intervention get it in you know whichever GP surgery they're in." [HCP]

However, the Health Boards have taken different approaches to rolling out the programme and, in some places, establishing the role, banding and job description for the AWDPP HCSW has introduced variation of delivery and the pace of delivery has differed considerably. Some clusters and an entire Health Board are (in Jan 2023) some months behind schedule and what is being delivered is not always the same.

"I do think it's positive that it's brought into wider programmes of work, but I also think it's really important that the fidelity of the programme is maintained within that, and the importance of that relationship building and trust and sort of across partners, so that everyone's on the same page with regards to that shared understanding and shared delivery, you know." [HCP]

"…the job descriptions weren't even necessarily the same…" [HCP]

"..we've had real issues with getting our job descriptions through Agenda for Change, so that's put us back by a good eighteen months with our project." [HCP]

Looking at the AWDPP at this stage in the roll-out of Wave 1 the intent to provide and deliver the programme in line with Prudent Healthcare is, thus far, successful and delivers against all four principles.

6 Discussion

6.1 Enablers and Barriers to Implementation

6.1.1 Enablers

The primary enablers of the AWDPP implementation were felt to be the national protocol and national training programme. Data from service users, the Lead Dietitians and HCSWs confirmed that the training that has been delivered has enabled the HCSWs to gain useful knowledge, particularly around nutrition and improved their confidence and competence to deliver the AWDPP. This is except for the IT training that was felt to be insufficient and proved to be a barrier to successful implementation. Other enablers included the peer support of others implementing the national programme and the national Dietetic Lead role. Good relationships and engagement with General Practices were also key to enabling implementation.

From a service user perspective, those who attended an appointment found the time and location of the appointments on offer convenient and were motivated to attend by the desire to obtain further knowledge to reduce their risk of T2DM (Table 16).

6.1.2 Barriers

One of the major barriers to AWDPP implementation was staff turnover and banding of HCSWs. Recruitment of Band 3 HCSWs has been time consuming in most of the Health Board areas so regular staff turnover, in small teams with little or no cross cover, has and will continue to directly impact the delivery of the programme. A further barrier was lack of support with IT and negotiation and sign off of data sharing agreements. It was suggested by HCSWs and Lead Dietitians that this could be facilitated as a central administration function. In particular, access to GP systems should be agreed at the beginning of the programme at a cluster level. This would free up Lead Dietitian time to undertake more of the triaging and clinical tasks.

Time allocated to Lead Dietitians was felt to be insufficient. Each Health Board had funding for 0.25FTE Lead Dietitian per primary care cluster, however much more time was being spent by the Lead Dietitians in all Health Boards during Wave 1 of the AWDPP implementation.

A large percentage of potential service users were escalated to the Lead Dietitian for review, and subsequently assessed to be clinically inappropriate for the programme. It is important to understand the reasons for exclusion, not just escalation, as there may be a case for reviewing the inclusion / exclusion criteria and the search template identifying people for the programme.

Suggestions were also made on how to increase uptake of the programme and encourage wider engagement. These included raising awareness of the AWDPP and T2DM in general, via General Practice. Initially promotion of the programme was intentionally ‘low key’ as the majority of people and practices in Wales would not have access to the programme in the first phase. Caution was exercised so that expectations were not raised early on. It was felt that if people had a greater understanding of the seriousness of diabetes and its potential consequences, diabetes prevention would be taken more seriously by the public. It was suggested an awareness campaign for the AWDPP could be run using posters in General Practices. It was also suggested that a follow up letter be sent to people who did not respond to the initial invitation. This second letter would be worded differently to the initial invitation and could give some facts and figures on participation in the programme so far, along with some motivational examples from individuals of changes made and their benefits.

6.1.3 Potential barriers for service users

For some service users, not knowing what to expect from the programme could be a barrier. It could be made clearer that this is a diabetes prevention programme, rather than weight management programme.

A small number of people who responded to the invitation letter declined an appointment because of work or caring responsibilities. Some flexibility in appointment time may have accommodated these issues but it was not a major barrier for those who took part in the evaluation.

It was also felt the programme could be made a little more inclusive by actively inviting a partner or other family member to attend the appointment who could provide support, not only during the appointment but also with making and maintaining lifestyle changes. The point was made that people often share or rely on others to provide food so dietary changes can impact others if part of a household.

We were not aware of any unintended consequences for service users although this could be explored further in the outcome evaluation. High body mass index was associated with low uptake, and similarly there was lower uptake in areas of high deprivation. These are groups that might be deemed a priority to access.

6.2 The Value of the AWDPP Intervention: Lessons Learned

Looking at the AWDPP at this stage in the roll-out of Wave 1 the intent to provide and deliver the programme in line with Prudent Healthcare is, thus far, successful and shows potential in delivering against all four principles as the programme matures.

There was significant enthusiasm and support for the AWDPP throughout the Health Board teams in all roles and at all levels. However, some local practicalities of the roll-out absorbed much time and resource putting the local timelines back, in some cases significantly. Individual Health Boards have taken different approaches to rolling out the programme and, in some places, establishing the role, banding and job description for the AWDPP HCSW has introduced variation of delivery and the pace of delivery has differed. Our survey findings indicate that the AWDPP intervention was highly valued by service users in providing an appointment tailored to their own personal needs, with a high rate of attendance and evidence from the qualitative research that service users were willing to make changes in their lifestyle to address their risk factors.

Drawing upon our findings we discuss the key lessons learnt from our evaluation.

- The implementation of the AWDPP was an ambitious programme of work and as shown in our evaluation, required complex thinking, planning, engaging and delivery to be adopted - at pace and at some scale - across the Wave 1 primary care clusters across NHS Wales Health Boards. Due to this complexity, the ambitions of the AWDPP timeline were inconsistent with the realities and pace of working on the ground in the Health Boards

- There is an important trade-off between implementing a national 'protocol-driven' programme of change versus the realities of how this is implemented for local context and needs. The challenges perhaps seen in this phase of the national roll-out may be due to this being a 'top-down' approach rather than a 'bottom-up' approach used within the pilot work. Our evidence suggests that funding and engagement were central to the governance and management of the AWDPP during this early phase.

- Our findings suggest there are some gaps in how the theory of change has been operationalised in practice and that this could have been more explicit in its use through the roll-out e.g., to check that those on the ground understood the theory of change underpinning the AWDPP in order to apply it in practice. A potential area to consider as the AWDPP moves towards looking at the outcomes from attending the programme, is how the programme fits within other prevention programmes such as weight management in ensuring it is specifically addressing and can demonstrate how it is preventing T2DM.

- Related to the above, our evaluation was too 'early stage' to fully assess but the capacity to manage consequences and actions e.g., referrals onwards to NERS and other follow-up programmes, was variable. This is likely to be an important part of moving the AWDPP towards translating into outcomes as part of a pathway of preventative care.

- At the time of this evaluation, it is premature to determine whether or not there is equitable access to the AWDPP, and related to this, understanding why eligible service users do not take up the intervention. Our findings to date suggest that clearer messaging around T2DM prevention rather than general weight management may encourage engagement with the programme. Further exploration could be undertaken

to understand the reasons why eligible service users, particularly those with a higher BMI and from areas of highest deprivation did not take up the AWDPP intervention.

- Managing the grant allocated to the Health Boards and the practicalities of managing the funding and tasks caused a few issues at Health Board level at the beginning of the AWDPP roll-out which have been resolved. Whilst acknowledging the pace of the roll-out that occurred was necessary, identifying key contacts, establishing relationships and the communications between the local teams managing the budget and the central teams can be enhanced as further waves of roll-out occur. Stakeholder interviewees highlighted the need for good relationships with local teams when managing such a big programme.

- In addition, in all Health Boards, as the AWDPP was rolled out financial management and ability to use the budget available was affected by the challenges of recruiting and retaining the Band 3 HCSWs, resulting in slippage and underspend to a greater or lesser extent. Planning the next rollouts with a longer timeline and investigating ways of managing slippage because of staff recruitment processes will enable more effective use of available budget.

- Our findings suggest that roles and responsibilities were critical components to AWDPP. Whilst there was core funding in place e.g., % time funded over Wave 1, there were variances across Health Boards e.g., additional resources given to dietitian support in some instances beyond the core allocation set out in Wave 1. There were also differences in titles, banding and contracts for HCSWs, which may in part explain the challenges identified in recruiting and retaining staff.

- There has been much discussion about the band at which the HCSW role is currently offered. Whilst our interviewees varied in their opinion as to whether the role was a Band 3 or Band 4, they were unanimous in their concerns that a fixed term Band 3 HCSW to deliver the role was not conducive to sustainability of the programme. Aside from other matters if the band is re-graded to Band 4 then there are budget implications. For a budget management and sustainability perspective this is critical to resolve.

- The system context of delivering the AWDPP is critical. The challenges of IT are well recognised, but nonetheless hampered progress in the roll-out and delivery of the AWDPP, and these were evidenced at national and local level. Investment in IT training for the AWDPP delivery workforce was inconsistent at best.

- The future proofing of the AWDPP to provide equitable organisation and delivery of services, and ability to implement innovations for diabetes prevention under different funding models, lacks the consistent approach that the AWDPP aims to instil and that is needed for a concerted diabetes pathway.

- A consistent and powerful message from stakeholders, HCPs and service users is the potential value they feel the AWDPP has in reducing health problems related to diabetes and the burden of diabetes on the NHS.

6.3 The AWDPP in Context to Process Evaluation of Other Diabetes Prevention Programmes

As part of learning lessons from the AWDPP formative process evaluation to date, we have considered our methods and findings in context to the work reported on the English and Scottish Diabetes Prevention Programmes (DPP).

The English evaluation was organised under the broad umbrella of the DIPLOMA evaluation which was funded by the National Institute for Health and Care Research (NIHR) via a commissioned HS&DR call with £2,790,952 awarded over 5 years (April 2017-April 2023). Our evaluation is separately commissioned and has not formally engaged with any other groups who may be evaluating specific aspects (e.g., region-specific implementation) or who will be evaluating the AWDPP from an outcomes lens.

We suggest that the AWDPP programme team reflect on how this learning from our evaluation can be shared - not just to the AWDPP programme team - but also to inform building a community of evaluation practice for the AWDPP and sharing experiences to help build a whole-programme picture of the implementation rather than undertake evaluation in silos.

England's NHS DPP has reported several papers of its evaluations set out in 8 work packages. To enable a reasonable 'like for like' comparison with the AWDPP programme at its current time horizon, we have focused on those papers reporting the early-stage findings that are generally aligned to the objectives we set out in our evaluation protocol.

The early lessons of implementing the NHS DPP were reported by Stokes et al, in 2019 [31]. This work focused on informing the sampling strategy to inform the selection of case sites as part of the wider, longitudinal DIPLOMA evaluation. Whilst this was not an explicit strategy of our evaluation, our findings around the context and mechanisms of impact have indicated that there are several factors that align to the DIPLOMA evaluation team's findings. Their first three key findings resonate with ours in terms of 1) managing new providers, 2) promoting awareness, and 3) recruiting service users. It was difficult to compare to the English funding model. However, as shown in our findings from the value assessment, there are important issues regarding funding and sustainability of the AWDPP to consider.

An identifiable gap in our work compared to the DIPLOMA early-stage evaluation is that we have not been able to address equity considerations. A recent paper has suggested that the introduction of the NHS DPP in England reinforces existing inequalities in care, with those registered in primary care practices that provide lower quality clinical care becoming even more disadvantaged [32]. A finding for our evaluation is that we did not identify any unintended consequences other than evidence suggesting that some service users expressed other health concerns (e.g., mental health) but there were limited avenues within the AWDPP for signposting other than to the GP. We suggest that such unintended consequences should be examined in any future evaluation of the AWDPP.

Whilst it was clearly beyond the scope of our formative evaluation and notwithstanding the challenges we found, the potential benefits of the AWDPP team working closely with the SAIL databank provides substantial opportunities to understand how the AWDPP intervention can change outcomes in the Welsh Population, and we suggest that capturing data to formally inform equity considerations is a priority for future evaluations. Our evaluation has also shown the potential to include capturing of patient reported outcome such as Health Related Quality of Life (HRQOL) using the EQ-5D 5L questionnaire to add value to how we understand the difference and impact that a diabetes prevention programme makes to people and populations.

An identified gap in our evaluation has been a comprehensive assessment of fidelity. The findings from DIPLOMA from several investigations of the fidelity of the NHS DPP showed wide variation and fidelity drift across participants [33] and providers [34] and suggest that fidelity must be thoroughly considered as part of any future summative process evaluation.

Scotland have recently reported on their qualitative process evaluation of their Framework for the Prevention, Early Detection and Intervention of Type 2 Diabetes [35]. This focused on the implementation in three early adopter sites. Whilst there are clear differences in how the programme was implemented compared to AWDPP (e.g., digitalisation of the intervention as part of the COVID-19 challenges), there are common take-home findings between our two evaluations. Similar to Scotland, the motivations for service users to join were around concern about pre-diabetes, desire to improve health or recommendation by a professional. They also found that service users were positive about their experience and changes made as a result of participation. Consistent with our findings, information governance was a barrier, alongside concerns about sustainability of funding beyond the current allocation. The importance of key staff was pivotal to their success, like AWDPP, and similarly the early sites found challenges in staff turnover. Navigating relationships was challenging but, similar to our evaluation, enabled many lessons to be learnt to strengthen interactions and collaborations across different teams and regions. In line with our findings, the engagement of primary care staff was a key determinant of success. Their conclusions focused on recommendations around i) wider range of programme options; ii) financial support and commitment to longer-term planning; iii) partnership working and feeding the findings from these early adopters into wider roll-out to ensure shared vision and common understanding iv) improved systems around information governance and v) building relationships with primary care.

6.4 Strengths and Limitations

A strength of our evaluation was the inclusion of a wide range of stakeholders, delivery staff and service users in order to make sure all aspects of the Wave 1 AWDPP programme implementation was represented, however there were limitations in the numbers of participants in the AWDPP included due to delays in the set-up of the programme, the number of HCSWs that could contribute to the interviews and focus groups because of delays in recruitment and local programme start-ups. Because of the later than anticipated start, the time available to carry out the formative process evaluation was reduced.

We also acknowledge the potential for bias in our reporting as we focused on those participating in the AWDPP programme rather than those who chose not to or could not engage. Due to the lack of available data, we were unable to analyse differences in how AWDPP has been delivered across ethnicities and across disability status. We were therefore unable to make any comments on these equity concerns. These limitations, however, are unlikely to impact research credibility.

7 Considerations

We have drawn together our key findings to set out the following considerations:

1. The AWDPP theory of change provides a roadmap for how activities and outputs will lead to outcomes and impact and help identify assumptions and gaps in the logic model. The purpose and benefits of using a logic model could be shared with stakeholders to better inform decision making and improve programme outcomes. The logic model should be reviewed and updated regularly to ensure that it remains relevant and useful over time and for further evaluation of the AWDPP.
2. Review the inclusion / exclusion criteria around age cut off and BMI and communicate the rationale for the criteria to ensure they are applied evenly. As part of the review consider the ethics of testing for risk factors but not 'treating' or ‘preventing’.
3. There were limited avenues within the AWDPP for signposting service users with other health concerns (e.g., mental health) to support services other than advising to speak to their GP. Local signposting needs further development as part of the intervention refinement and HCSW training to ensure consistent practice across Wales.
4. Provide a consistent approach to the title, banding and funding for AWDPP delivery staff. The longer-term sustainability of the AWDPP will be reliant on the workforce, and efficiencies may be gained (e.g., to reduce the costs associated with recruiting and training of staff) if this role became more attractive and recruited/retained a motivated and skilled workforce.
5. Further, targeted investment in communication and engagement with GP practices could be given, including maintaining this through the delivery of AWDPP. Financial incentives to reimburse the time and support from GP practices could be explored.
6. Findings from this formative process evaluation could be shared with the key decision makers involved in the information governance of AWDPP to present the IT challenges that have been identified.
7. Build upon the communities of practice already established to share knowledge, experience and learning from the AWDPP.
8. Scrutiny of the evidence gaps found in our evaluation require examination to inform any subsequent evaluation phases alongside the wider implementation of the AWDPP.
9. Overcoming the barriers for access to data that will enable fuller understanding of equity.
10. Investigate the early evidence that take up of AWDPP is lowest in areas of highest deprivation and for those with high BMI.

8 Conclusions

Approximately one year into the roll-out of AWDPP (Wave 1) the intent to provide and deliver the programme in line with Prudent Healthcare is successful, delivering against all four principles, and is promising in terms of demonstrating value**.** Inevitably, as this is a big ambitious and complex programme to roll-out in a short period of time, there have been some challenges. None of these are unsolvable and indeed the stakeholder community interviewed have proffered solutions. We have offered points for consideration and our findings can be used to inform the subsequent phases of the AWDPP roll-out across Wales.

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