

# **The Inverse Care Law Programme 2013-18 Update Report**

Date of Report: September 2019

Date of Next Report: September 2020

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## 1. Inverse Care Law Programme Update Report

This report has been prepared on behalf of the National Inverse Care Law Programme Board, which succeeded the Inverse Care Law Programme Development Board which was set up by Welsh Government to oversee the national element of the programme. To give context to this report, which was largely developed under the previous governance arrangements, the Terms of Reference and membership of the Programme Development Board (2016) are attached as Annex 1.

## 2. Executive Summary

### 2.1 The Programme

The Inverse Care Law (ICL) Programme in Wales was conceived in 2013 with expert input from eminent primary care academics including Professor Julian Tudor Hart. It was predicated on a logical extension of the law - that eliminating the deficit in access to healthcare for needier populations would reduce their excess of morbidity/mortality. It was an expression of Julian Tudor Hart's hope that "pre symptomatic diagnosis and screening, which can be best done at primary care level, is possible within NHS General Practice".

As a national initiative, the ICL programme (2013) was intended to accelerate the development of innovative and effective models of primary care services in the areas of Wales where the impact of poverty was most marked. This linked directly with the Welsh Government's commitment to tackle poverty, by clearly understanding local needs and developing service provision accordingly. An [Inverse Care Law Programme Timeline](#) identifies key phases in its development.

The two University Health Boards with the highest premature mortality rates and health inequalities (Cwm Taf UHB and Aneurin Bevan UHB) were invited to develop a programme of work to achieve measureable improvement in health and wellbeing, for defined populations, with a reduction in variation in life expectancy between socioeconomic groups as a key priority. This would include actions to improve the prevention and management of chronic conditions and reduce premature mortality.

### 2.2 The Cardiovascular Risk Assessment (CVRA) Model

The Cardiovascular Risk Assessment (CVRA) aspect of the programme which commenced in 2015 (also known as *Living Well, Living Longer* in ABUHB and *Cwm Taf Health Check*), has identified and supported individuals to reduce their risk of cardiovascular disease through engagement, information and access to good clinical care and lifestyle support.

The CVRA model invites eligible GP registered patients (aged 40-74 (64 in ABUHB), not otherwise known to have cardiovascular disease (CVD)) to attend a health check

or assessment with a trained Health Care Support Worker. During the consultation a 10 year risk of Cardiovascular Disease (QRisk2 score) is calculated from measurements and information provided by the individual; the results are discussed with the patient together with advice on how to reduce the risk and any support available to achieve this. Whilst the main focus of the approach is lifestyle risk reduction, there are safeguards in place to pick up previously undetected risk factors that would trigger an immediate clinical referral.

[The logic model](#) of the ICL programme captures the end goal of impacting CVD-related morbidity and mortality, and also through proximal risk factor management all-cause mortality.

The model has been shared with other health boards through the NHS Wales Cardiovascular Risk Assessment Programme (under the auspices of the national ICL Programme). Abertawe Bro Morgannwg and Hywel Dda University Health Boards successfully established pilot programmes during 2017/18.

## 2.3 Learning from the Programme

Much has been learned from undertaking this programme and key points are captured in this report. The programme demonstrated:

- the feasibility and value of utilising an affordable, and readily available and appropriately-trained primary care-based workforce resource to enhance the identification of previously unrecognised cardiovascular disease risk and signpost into existing lifestyle and/or clinical interventions aiming to modify such risk
- that many preventive activities that were traditionally performed by registered primary care staff can be successfully taken on by Healthcare Support Workers (or other similar roles) working within a prudent, robust framework of governance, training and management. The success of this approach has possible application to many other areas of primary care transformation through the primary care strategic programme

- successful development and delivery of a social model of CVRA delivered by appropriately trained Health Care Support Workers, providing capability and capacity to GP practices to implement national guidance (NICE CG181) with pace and at scale
- ability to link into Clinical Pathways with appropriate clinical governance arrangements
- (from patient feedback) that those who attend the 40 minute CVRA appointment like the experience, although as many as 50% of those invited do not take up the offer, which is a key area for further exploration
- feasibility of undertaking CVRA with full use of software in GP practice premises, other health care settings and community venues with minimal difference in uptake
- that models developed in one health board can be adapted and implemented successfully in other health boards. However, the imperative to roll out the programme before a full evaluation had been conducted meant that opportunities were missed to strengthen the programme at its foundation and in its linkages with services/initiatives aimed at changing disease risk
- development of a range of products:
  - Training programmes and operational manuals for Health Care Support Workers undertaking CVRA in conjunction with the British Heart Foundation (BHF).
  - CVRA Software tailored for Wales – for use in both Practice and Community settings
  - Publicity and patient materials
- Primary care and public health working together with wider partners with shared objective of improving population health; providing opportunity for practices to make contact with patients who otherwise wouldn't attend the surgery or take interest in their health and wellbeing; providing additional capacity to practices enabled them to take an active interest in CVD prevention and social referral
- that the availability of services to support lifestyle change is key – lack of low level weight management support service being a serious concern

## 2.4 The evaluation of impact

The programme has:

- provided an unique experience of using SAIL to evaluate a complex intervention where:
  - Parallel local monitoring of data provided comparison
  - Data governance agreement with practices and data transmission posed challenges
- identified challenges in accessing data at individual patient level from lifestyle support services e.g. NERS which limited realisation of the unique data linkage feature of the SAIL technology
- delivered in excess of 25,000 cardiovascular risk assessments between February 2015 and May 2018.
- successfully targeted inverse care by reaching more deprived populations. For example, 94% patients attending CVRA live in areas that fall into deprivation quintiles 1,2 or 3
- successfully identified lifestyle and clinical risk factors and advised or directed patients to further assessment, accordingly. Offer of access to good quality risk modifying health care has been demonstrated but there are gaps in the availability and consistency of services across health boards
- whilst indications are good, longitudinal outcome data at individual patient and population level will be required to establish whether the programme has successfully modified risk of CVD and led to reduced CVD (and all cause) morbidity and mortality in those individuals.
- at this time, we are not able to capture the results /risk modification outcomes from lifestyle referrals and activity including;
  - Weight loss following referral to and participation in a weight management programme
  - Number of people who have quit smoking following referral to *Help Me Quit* or other programmes including Community Pharmacy and self-help
  - Increased physical activity/weight loss following referral and participation in the NERS programme or other local programme.

## 2.5 Recommendations

Valuable learning has been gained from undertaking this programme to date. It has demonstrated an ability to reach more deprived populations, in an effort to mitigate the effects of poverty on health and close the inequality gap. Despite good uptake and promising early outputs, there is more work to be done to encourage wider population engagement with this programme. In addition, greater focus is needed on the availability and sustainability of support services as well as refining the method of evaluating the impact of this approach over time.

### **Recommendation 1:**

Establish a detailed next phase of the national Inverse Care Law Programme in Wales that consolidates the model based on the valuable learning to date; the re-focused programme will inform the Primary Care Strategic Programme and contribute to the realisation of the prevention vision set out in a *Healthier Wales*. **Progressed by National Inverse Care Law Programme Board by end September 2020**

### **Recommendation 2:**

Explore the challenges posed by the evaluation of the programme with particular focus on addressing the weaknesses in the data architecture underpinning the programme. **Progressed by National Inverse Care Law Programme Board, PHW and Swansea University (SAIL) by end December 2019**

### **Recommendation 3:**

Explore opportunities for health economic evaluation of the programme and longitudinal research drawing on the strength of the SAIL database. **Progressed by the National Inverse Care Law Board by March 2020**



### 3. Introduction

Julian Tudor Hart, a GP serving a socio-economically deprived South Wales mining valley published in The Lancet (February, 1971) his seminal paper which described the 'Inverse Care Law'. His assertion was that;

*'The availability of good medical care tends to vary inversely with the need for it in the population served. This inverse care law operates more completely where medical care is most exposed to market forces, and less so where such exposure is reduced'.*

In his paper, Julian Tudor Hart referred to the inverse relationship between the need for good quality healthcare (measured by all-cause morbidity/mortality) and access to it (measured largely by primary and secondary care indices such as GP workload, clinical effectiveness of consultations and hospital bed availability). Professor Hart also demonstrated a significant improvement in the life expectancy of his practice population by the delivery of systematic, proactive primary care to his registered population.

### 4. Inverse Care Law Programme (2013)

The Inverse Care Law (ICL) Programme in Wales was conceived in 2013 with expert input from eminent primary care academics including Professor Julian Tudor Hart. It was predicated on a logical extension of the law - that eliminating the deficit in access to healthcare for needier populations would reduce their excess of morbidity/mortality. It was an expression of Julian Tudor Hart's hope that "pre symptomatic diagnosis and screening, which can be best done at primary care level, is possible within NHS General Practice".

As a national initiative, the ICL programme (2013)<sup>1</sup> was intended to accelerate the development of innovative and effective models of primary care services in the areas of Wales where the impact of poverty was most marked. This linked directly with the

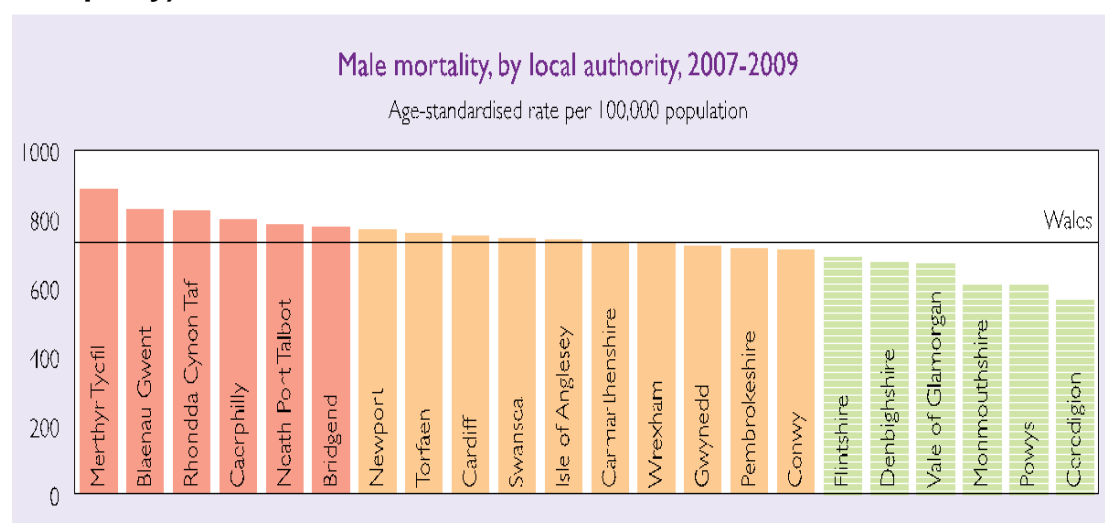
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<sup>1</sup> Welsh Government Inverse Care Law Programme (2013) document on file.

Welsh Government's commitment to tackle poverty, by clearly understanding local needs and developing service provision accordingly.

The two University Health Boards with the highest premature mortality rates (Cwm Taf UHB and Aneurin Bevan UHB) (Figure 1) were invited to develop a programme of work to achieve measureable improvement in health and wellbeing, for defined populations, with a reduction in variation in life expectancy between socioeconomic groups as a key priority. This would include actions to improve the management of chronic conditions and reduce premature mortality.

**Figure 1: Male Mortality Rate identifying highest rates in Cwm Taf (Merthyr Tydfil and Rhondda Cynon Taf) and Aneurin Bevan (Blaenau Gwent and Caerphilly)**



Source: Office for National Statistics

The programme was intended to address the mismatch between need and access to services identified by Professor Julian Tudor Hart. It would encourage local clinicians to adopt a community orientated approach, working collaboratively with partners to meet the needs of their communities and to identify and act upon opportunities to prevent ill health and premature mortality.

#### 4.1 Aims & Objectives

The overall aim of the ICL programme (2013) was to reduce the variation in life expectancy between socioeconomic groups. It was deemed important to mitigate the impact of poverty by ensuring that the high prevalence of chronic conditions in

socioeconomically deprived communities was supported by the capacity and quality of services that is required to meet local needs. This work would include longer-term strategies to address the wider determinants of health and wellbeing.

At the time the programme was developed, the greatest impact upon life expectancy in Wales<sup>2</sup> was due to cardiovascular disease. This was identified therefore as a priority area with a particular emphasis on improving the identification and management of high blood pressure and cardiovascular risk. The Inverse Care Law work was conceived to deliver a systematic approach to ensure that individuals were offered opportunities for assessment and supported to make choices about lifestyle changes or medical treatments to reduce cardiovascular risk.

This approach required that contacts allow sufficient time to deal with patients own concerns and to identify other health issues that may require intervention. This is particularly important in areas of socioeconomic deprivation as chronic conditions are more common and onset occurs at an earlier age.

Although at the time cardiovascular disease was the major cause of premature mortality, prevalence was falling and early deaths from cancer and alcohol related harms rising. The Programme would also consider medium and long term strategies to address this issue and the problems associated with other challenges such as rising levels of obesity.

The ICL programme (2013) was designed in three phases:

**Phase 1:** Deliver current systems of care effectively and efficiently across all areas, ensuring that care in the most deprived areas matches the best elsewhere:

**Phase 2:** Develop locality networks (Primary Care Clusters) to ensure patient centred, coordinated care based on local needs

**Phase 3:** Integrated Plans to describe how local services will be developed, including detailed workforce plans to support new roles and models of care.

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<sup>2</sup> The 2018 PHW Observatory report (Global Burden of disease) identifies that the most prominent conditions contributing to overall burden of disease in Wales, expressed as number of years lost due to ill-health, disability or early death (DALYs) are cancer, cardiovascular disease, mental health and Musculoskeletal conditions (MSK).

This work would develop and test innovative new models of care that promote community-orientated primary care and capitalise on all community assets. The Improvement Unit, Public Health Wales provided dedicated support for a number of months to support the Health Boards to implement this work using quality improvement methodology.

## 5. Cwm Taf and Aneurin Bevan CVD Risk Assessment Pilots

The two health boards worked together with Welsh Government, Public Health Wales and others to develop parallel approaches which would deliver the ambition of the Inverse Care Law Programme 2013 with a particular focus (in the first instance) on cardiovascular disease<sup>3</sup> and Cardiovascular Risk Assessment (CVRA).

### 5.1 Evidence to support focus on Cardiovascular Disease

Cardiovascular disease was (and remains) a major cause of premature morbidity and mortality, contributing to health inequalities and significant health and social care costs. Whilst rates of premature death attributable to cardiovascular disease had fallen in people under 75 years of age between 2001 and 2009, the reduction was greatest in the least deprived population resulting in a widening inequality in premature circulatory disease mortality (Figures 2 & 3).

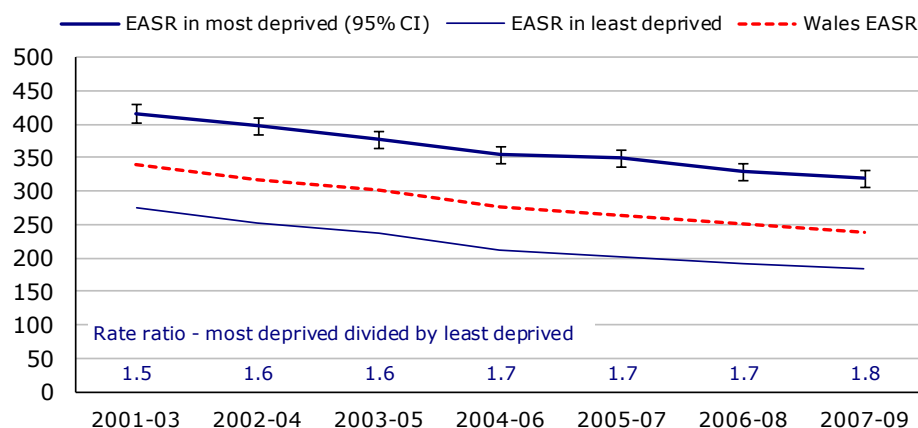
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<sup>3</sup> Actions to reduce the risk of cardiovascular disease will also contribute to the prevention of cancers, which is increasingly a major determinant of inequalities in health experienced

**Figure 2: Mortality from Circulatory Disease, Males, 2001-09<sup>4</sup>**

**Mortality from circulatory disease, all ages, males, European age-standardised rate (EASR) per 100,000, Wales, 2001-09**

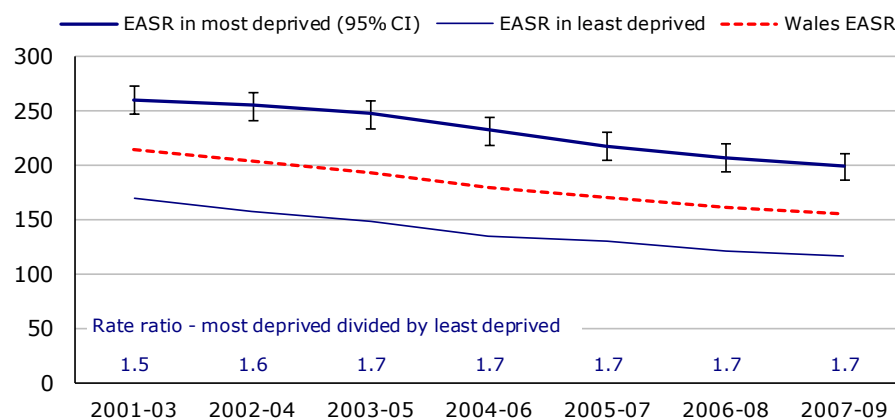
Produced by Public Health Wales Observatory, using ADDE/MYE (ONS), WIMD 2008 (WG)



**Figure 3: Mortality from Circulatory Disease, Females, 2001-09**

**Mortality from circulatory disease, all ages, females, European age-standardised rate (EASR) per 100,000, Wales, 2001-09**

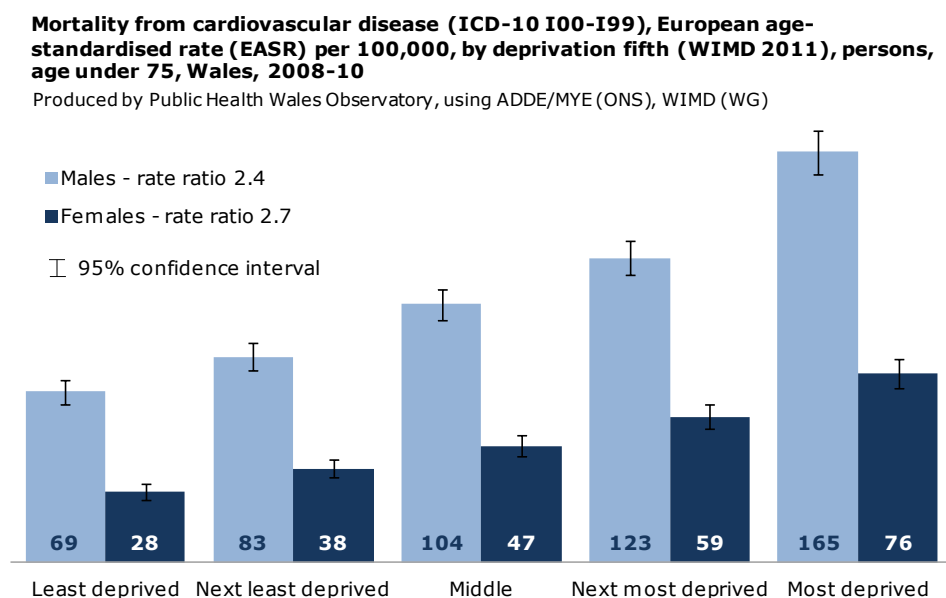
Produced by Public Health Wales Observatory, using ADDE/MYE (ONS), WIMD 2008 (WG)



The significant inequity in premature mortality from cardiovascular disease between the most and least deprived fifth of the population in Wales (2008-10) is illustrated in Figure 4.

<sup>4</sup> PHWO. Measuring inequalities: trends in mortality and life expectancy in Wales. November 2011. [http://www2.nphs.wales.nhs.uk:8080/PubHObservatoryProjDocs.nsf/\(\\$All\)/BA402B3D53C6A33D8025795E00556236/\\$File/InequalitiesProfiles\\_AllWales\\_Final\\_English\\_v1.pdf?OpenElement](http://www2.nphs.wales.nhs.uk:8080/PubHObservatoryProjDocs.nsf/($All)/BA402B3D53C6A33D8025795E00556236/$File/InequalitiesProfiles_AllWales_Final_English_v1.pdf?OpenElement) [Accessed 9 Mar 2016]

**Figure 4: Rates of premature mortality (age under 75) from cardiovascular disease by deprivation fifths<sup>5</sup>**



## 5.2 The history of cardiovascular risk assessment and management in Wales

There had been a number of initiatives in Wales including the Inequalities in Health Fund and the publication of a Cardiac Disease National Service Framework in 2009, which included standards for promoting healthy hearts and managing risk factors. This was followed in 2010 by the **Halcox Report**<sup>6</sup>, which recommended:

- A review of the existing systems for the prevention of cardiovascular disease
- The development of a national plan to identify those at most risk of vascular disease and
- Targeting those at the greatest risk.

Subsequent work undertaken by Public Health Wales demonstrated that a variety of approaches were in place within GP practices, with complimentary activity through

<sup>5</sup> PHWO. Cardiovascular disease - Wales data. 2011.

<https://wg.wales.nhs.uk/uniquesigf31510284af2ec6dcfb998c39315f7a88ce2223c1263895620e9f9605280fdf2/uniquesig0/sitesplus/922/page/54500> [Accessed 9 Mar 2016].

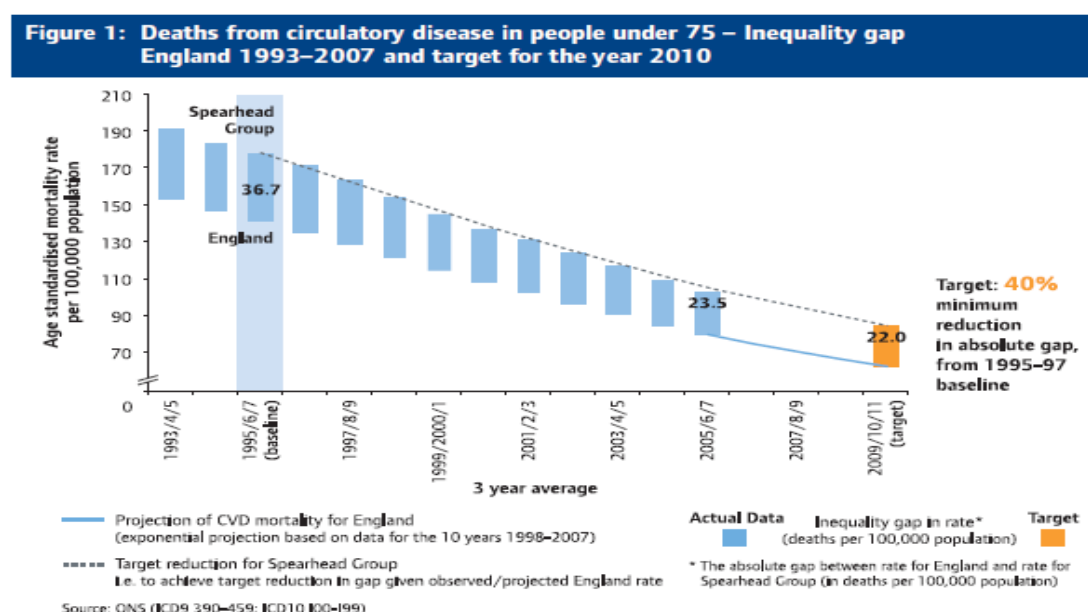
<sup>6</sup> [Vascular Risk Management in Wales - A report from the Vascular Project Group](#) . March 2010. Professor Julian Halcox.

<http://www.wales.nhs.uk/sites3/Documents/338/100823vascularriskassessmentreporten%5B1%5D.pdf>

other services such as community pharmacies and local initiatives led by public health teams. This reinforced the need for better coordination of activity, to capture and extend best practice.

The Cwm Taf and Aneurin Bevan UHBs developed and piloted approaches to CVD Risk Assessment with reference to the recommendations of the Cardiovascular Disease Review led by Professor Julian Halcox; support from Professor Chris Bentley and the Health Inequalities National Support Team (HINST) who had demonstrated successful reduction of inequalities in cardiovascular mortality in Spearhead Group Primary Care Trusts (Figure 5) as well as early learning from the NHS Health Checks in England.

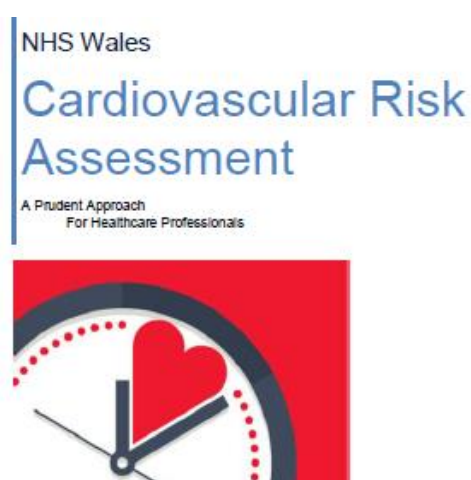
**Figure 5: Illustration of successful closing inequality gap England provided by HINST**



## 6. NHS Wales Cardiovascular Risk Assessment (National ICL Programme) 2016

In 2016, Health Boards across Wales were already undertaking a wide range of activities to prevent and manage cardiovascular disease but there was recognition that a systematic, population-scale approach, which was proportionate to the needs of the population, would more effectively reduce inequalities in cardiovascular disease.

The Heart Disease, Diabetes and Stroke National Strategic Implementation Groups came together to fund a national programme which would draw on the early learning of the experience in Cwm Taf, Aneurin Bevan and Project Sir Gar (Carmarthenshire) and assist other health boards to develop a programme approach to cardiovascular risk assessment within their Integrated Medium Term Plans, proportionate to the needs of the communities served. Each risk assessment would be used to provide advice and improve the identification of conditions such as atrial fibrillation and diabetes.



The programme<sup>7</sup> sought to develop and strengthen consistent advice and support for individuals to understand the importance of healthy lifestyle choices. Every Health Board would be assisted to develop a clear programme of activity and to ensure that, as a minimum, progress had been delivered in the most deprived Cluster in each Health Board by March 2018.

Through a prudent approach to cardiovascular risk assessment the programme would build upon existing services to increase access to cardiovascular risk assessment, information, advice and support to help improve individual knowledge

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<sup>7</sup> NHS Wales Cardiovascular Risk Assessment. A prudent Approach for Healthcare Professionals. Heart Disease, Stroke and Diabetes Implementation Groups 2015. Report on file.



and support to make healthy lifestyle choices, with medical management making a valuable contribution to a holistic management approach.

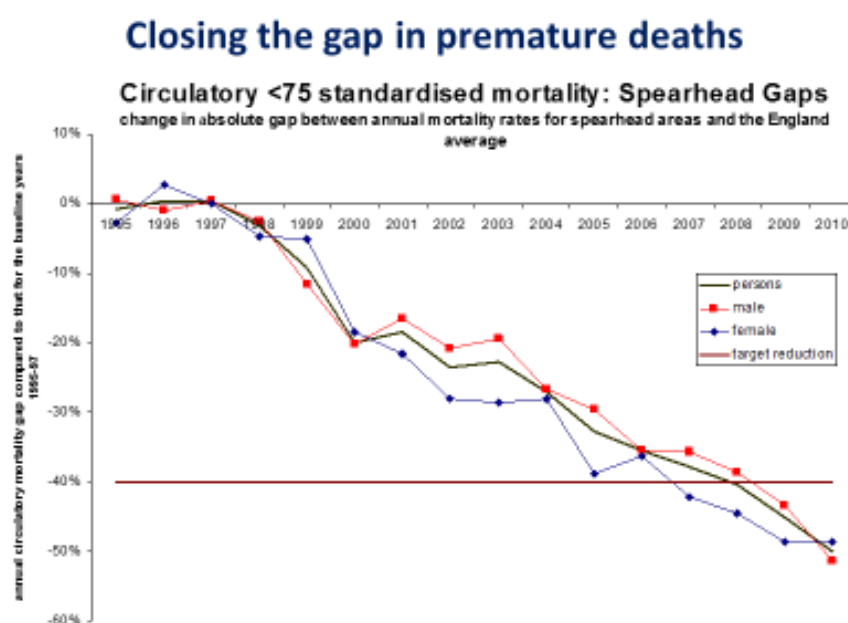
*“Taking action first where needs are greatest will help to reduce health inequalities and a needs based approach to service development will ensure that we begin to make real progress in reversing the ‘Inverse Care Law’”*

Chairs of Heart Disease, Stroke and Diabetes Strategic Implementation Groups

## 7. A programme approach to cardiovascular disease risk management

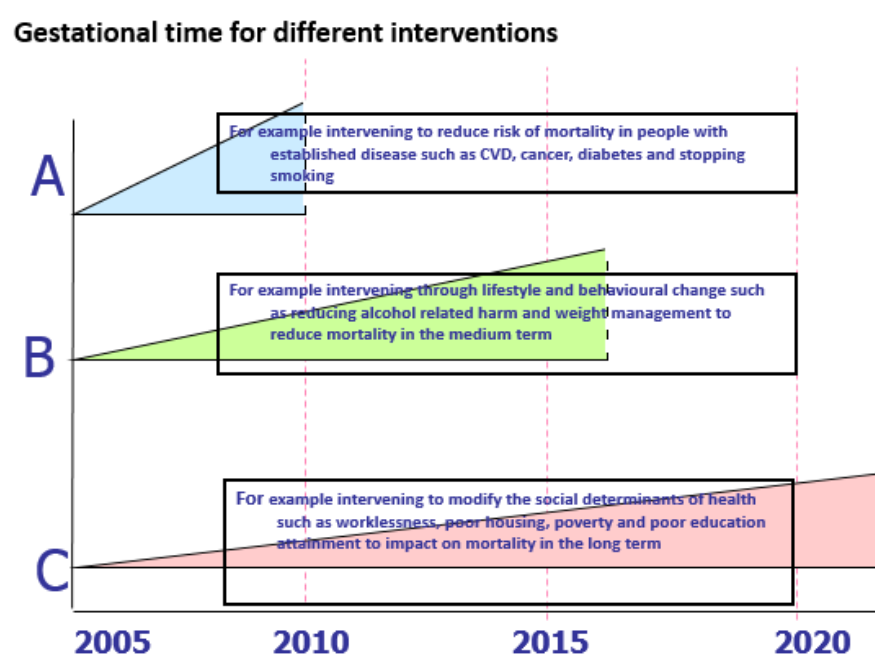
In developing a programme approach, the experience of closing the gap in premature mortality rates between the most and least deprived communities in England was considered. This had been achieved through systematic, sufficiently large population scale cardiovascular risk assessment programmes targeted at communities with the greatest burden of disease. This is illustrated for the Spearhead Areas (Figure 6).

Figure 6



The Health Inequalities National Support Team (Department of Health) developed a methodology that achieved measurable reduction in premature mortality in the most deprived parts of England. The key principle (Figure 7) was that to achieve impact in the short term (5 years) the focus needs to be on intervening to reduce disease progression and mortality in people with established disease. This is as well as working with partners to modify the social determinants of health through a life course approach, and to support people to adopt a healthier lifestyle before they develop disease.

**Figure 7 Produced by Professor Chris Bentley and Jane Leaman, Health Inequalities National Support team**

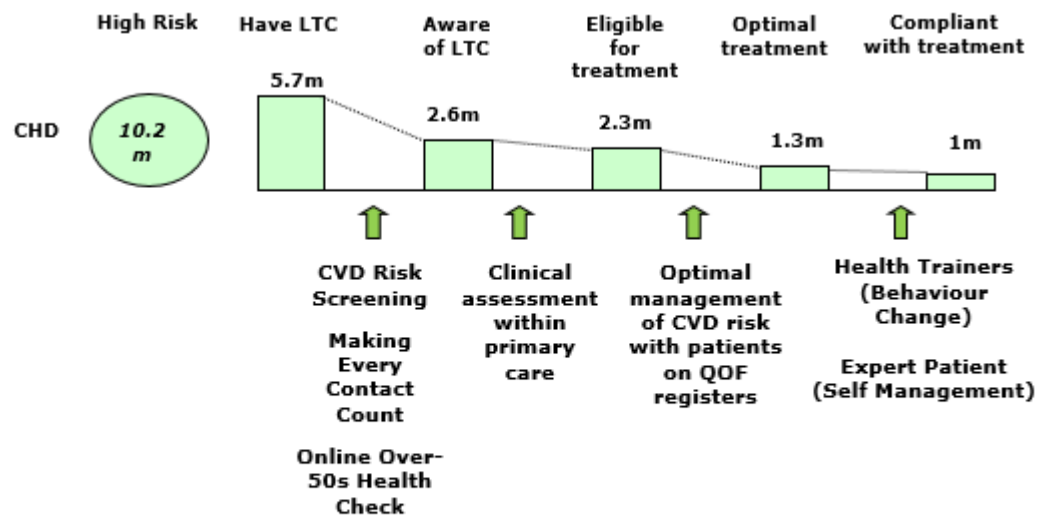


Produced by Professor Chris Bentley, Health Inequalities National Support Unit

## 7.1 Intervention Decay

Analysis of UK data on common chronic diseases by the Department of Public Health and Epidemiology at the University of Birmingham (2006) showed that of an estimated 5.7 million people in the UK with Coronary Heart Disease, less than 50% are aware that they have it, of whom 50% are on optimal treatment and less than 20% are compliant with optimal treatment. The pattern is similar for other chronic disease including Diabetes. This has been called intervention decay (Figure 8).

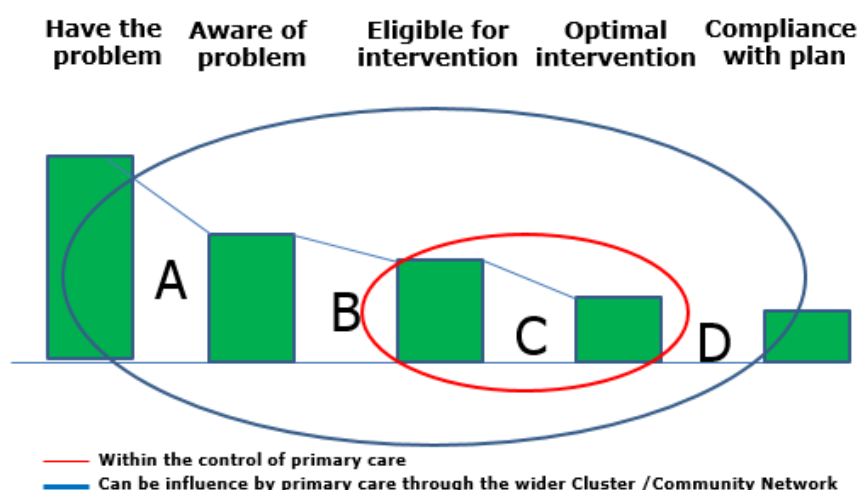
**Figure 8: Implementation decay and actions to increase the effectiveness of healthcare systems (UK data)**



Produced by Professor Chris Bentley, Health Inequalities National Support Unit. Figures are for UK. Taken from Harrison W, Marshall T, Singh D & Tennant R (July, 2006) The effectiveness of healthcare systems in the UK – scoping study. Department of Public Health & Epidemiology and HSMC University of Birmingham.

The programme approach recognised also where the influence lay in the system and the need for primary care to be supported with capacity and capability. The focus has been on cardio-vascular disease because of the readily available, proven interventions (Figure 9).

**Figure 9: Spheres of control and influence within primary care and wider clusters/ community networks**



Produced by Professor Chris Bentley, Health Inequalities National Support Team (adapted)

The NHS Wales CVD Risk Assessment Programme (2016) was developed following prudent health care principles to:

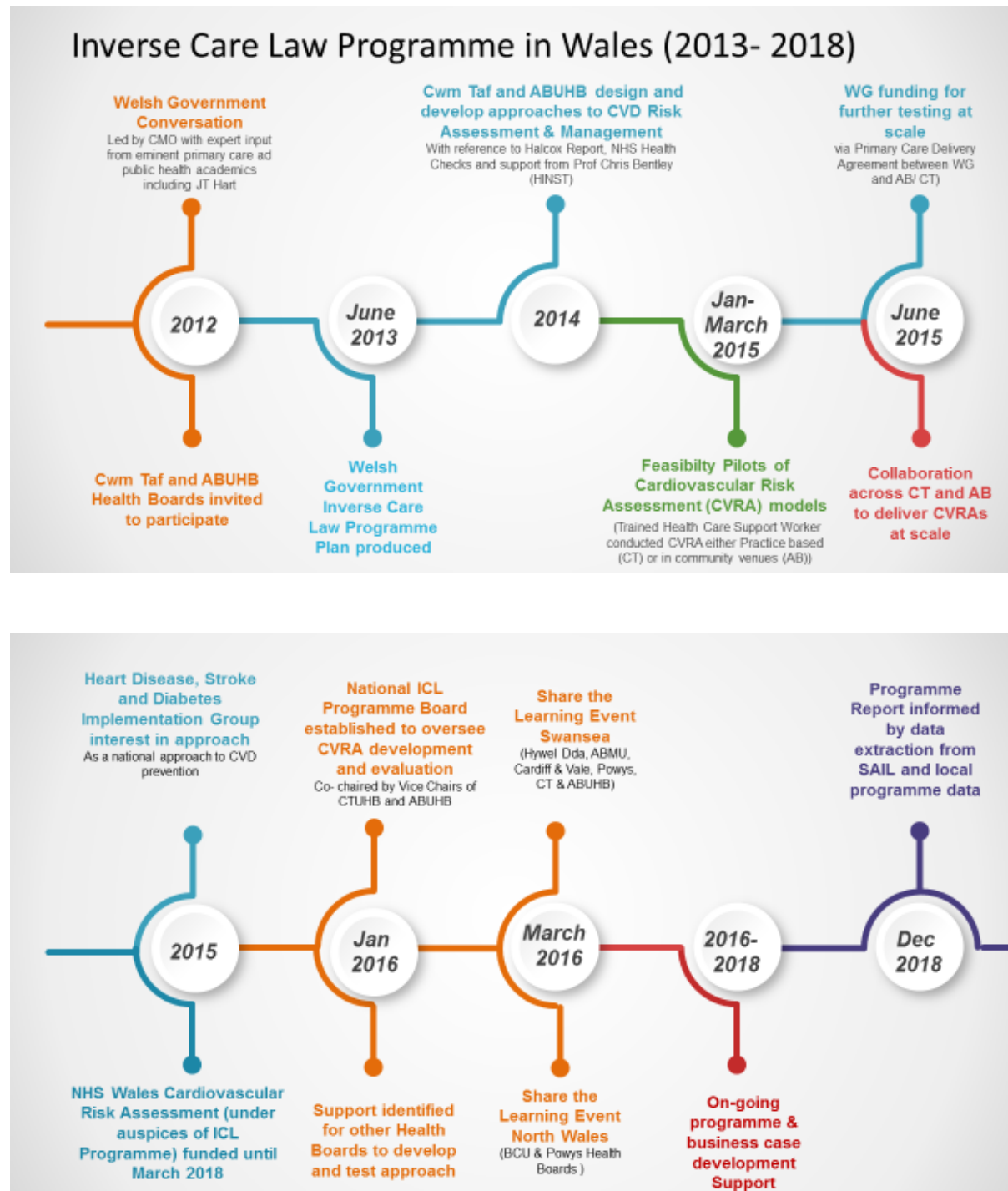
- Strengthen primary prevention
- Improve self-recognition of risk and behaviour change through supported self-assessment
- Target assessment for those most likely to be at significant risk
- Maximise the use of technology to support population segmentation, identifying those not already identified on chronic disease registers and prioritising those likely to be at highest risk
- Utilising risk communication software to improve access to information and support shared decision making (Estimated individual cardiovascular risk scores have been shown to perform reasonably well at predicting CVD events and can therefore be used to guide individuals to access appropriate advice)
- Extend motivational interviewing techniques across primary care teams to support citizens to identify and own personal goals for reducing their risk of cardiovascular disease
- Signpost to local services and support networks to encourage and enable behaviour change using a multidisciplinary approach
- Improve health literacy and understanding of cardiovascular disease and the impact of modifiable behaviour changes
- Enable referral to appropriate behaviour change support and ensuring interventions are provided in a timely and effective way.

The Cardiovascular Risk Assessment (CVRA) aspect of the ICL Programme which commenced in 2015, has identified and supported individuals to reduce their cardiovascular risk through engagement, information and access to good clinical care and lifestyle support. The model has been shared with all health boards in Wales through the NHS Wales Cardiovascular Risk Assessment Programme (under the auspices of the national ICL Programme) with an expectation for the other health boards to also apply the learning from the programme and develop local projects.

Abertawe Bro Morgannwg and Hywel Dda University Health Boards successfully established programmes during 2017/18.

## 8. Inverse Care Law Programme Timeline

Figure 10: Inverse Care Law programme timeline

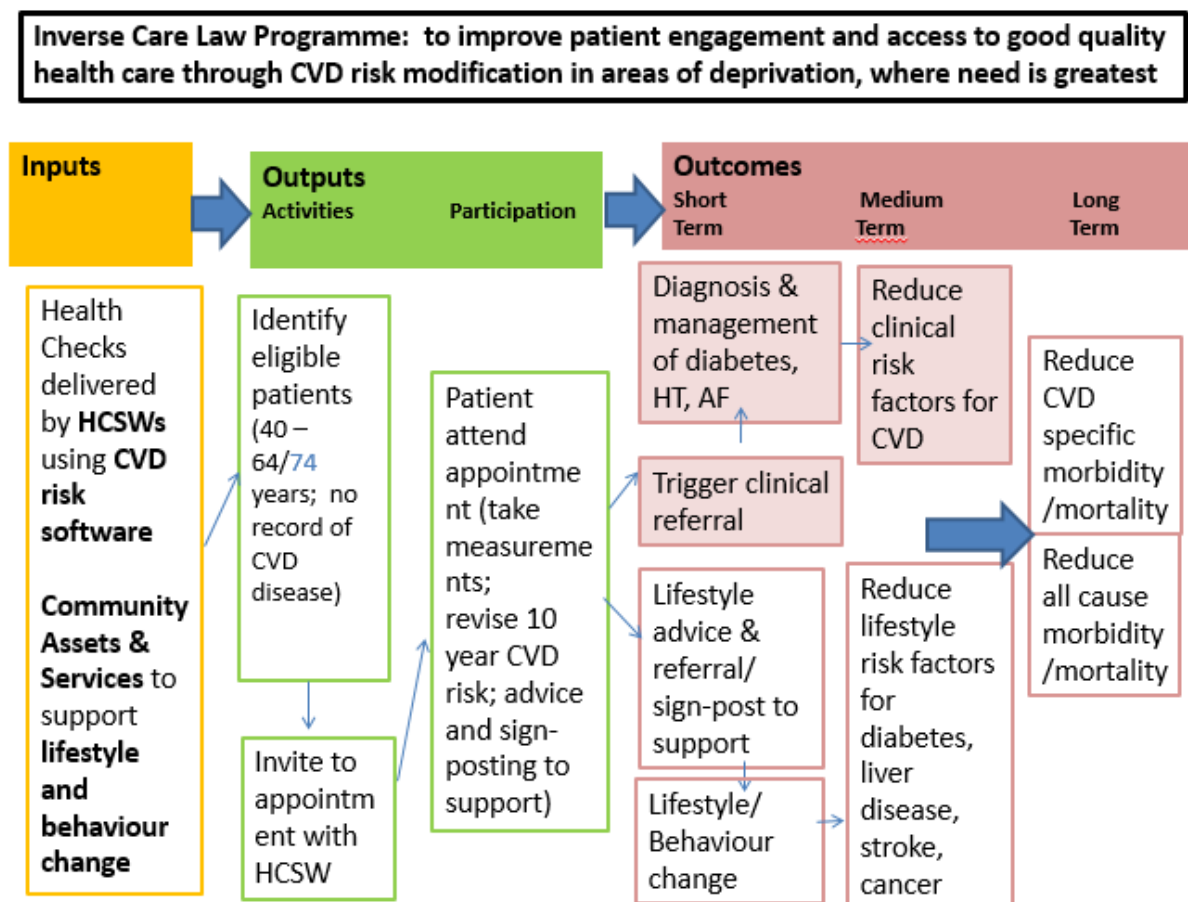


## 9. Inverse Care Law Programme

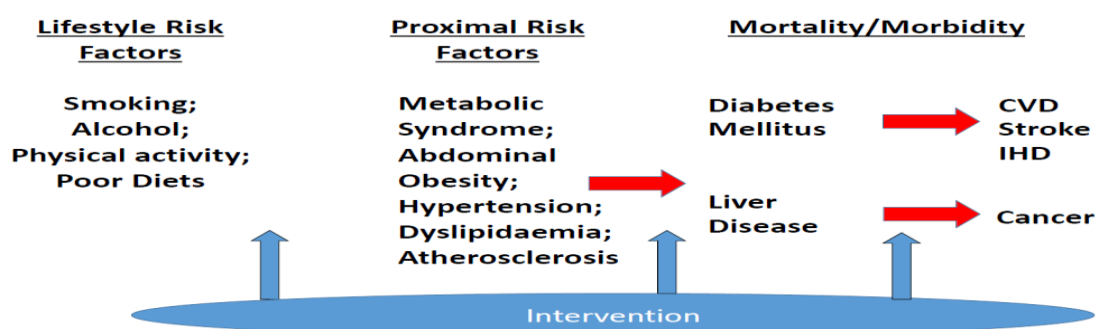
### 9.1 Programme Logic Model

The programme was predicated on a logical extension to the inverse care law - that improving public engagement and access to good quality health care e.g. through CVD risk modification would reduce CVD (and all cause) morbidity and mortality.

**Figure 11 Programme Logic Model**



The beneficial effect of intervening to correct lifestyle risk factors and proximal (clinical risk factors) is illustrated further below:



## 9.2 Implementing the CVRA

The CVRA models were piloted and refined by Cwm Taf and Aneurin Bevan University Health Boards to reflect the resource available, local need and circumstances. The two programmes shared a common framework / process, illustrated in Figure 12.

Practices were selected for invitation to participate in the programme, targeting practices serving areas of high deprivation. In Cwm Taf UHB, recruitment conversation included practice capacity to accommodate a Health Care Support Worker to undertake the Health Checks. This was not necessary in Aneurin Bevan UHB which used community venues. Practices were required to commit to undertaking the support and follow-up of patients identified with risk factors triggering agreed thresholds. These recruitment visits were conducted by Programme Manager or Primary Care Nurse. Practices were also required to have signed up to sharing data with SAIL.

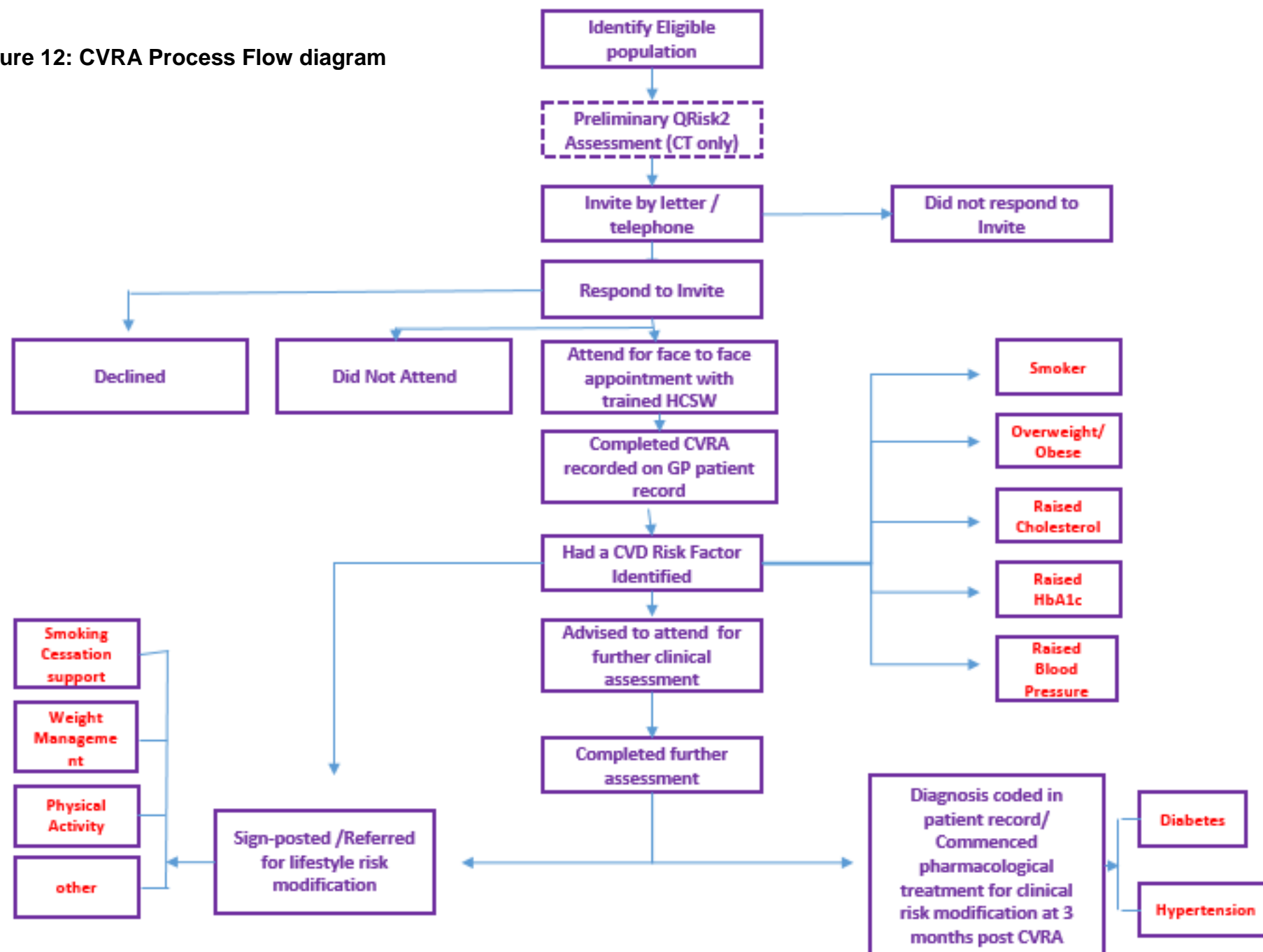
### Patient Eligibility Criteria

The eligible population in **CTUHB** is defined as patients aged 40-74 years, not on a CVD register who had an initial estimated 10 year CVD risk which was high (>20%); Medium (10-20%) or low (<10% with missing data).

The eligible population in **ABUHB** (and ABMUHB) is defined as patients age 40-64 years, not on a CVD register and living in the three most deprived quintiles (Q1 & 2)

The eligibility criteria for CVRA invitation excluded patients of a practice that were already on a cardiovascular register. This possibly incorrectly assumes that being on a disease register implies good quality care. Access to good quality clinical pathway management for patients with CVD was out-with the scope of the CVRA element of the programme, but in the spirit of the Inverse Care Law would be an important element to explore as expressed in the 2013 programme plan.

Figure 12: CVRA Process Flow diagram





The practice based software used in CTUHB enabled an initial estimation of 10 year CVD risk to be performed from data already held in patient record which enabled patient invitation to be prioritised. Area deprivation is factored into the QRisk 2 score from postcode of home address.

The ABUHB eligibility focused on area of residence which required NWIS to extract list of patients living in most deprived areas and provide to third party company who generated invites.

It was decided to reduce the upper age limit to 64 years in ABUHB to focus resources on a younger population perceived to have greater capacity to benefit.

## **Invitation Process**

A letter was sent to eligible patients, inviting them to attend for a CVRA – for ease of use and to ensure plain language was used to encourage participation – most programmes referred to the CVRA as a ‘Health Check’. Programmes would also send up follow up letters if no response was received. Telephone calls were also undertaken to invite participants to attend appointments.

In CTUHB, letters were generated by the HCSW in the practice and patients would phone the surgery to make an appointment. In ABUHB, the central Living Well Living Longer team would generate letters from practice generated patient lists. Patients would phone the central telephone centre to book an appointment.

## **Venues**

ABUHB delivered the programme in community based settings such as village halls and leisure centres. CTUHB delivered their programme in primary care/health settings (predominantly GP practices) although a community hospital and health park were also used where access to practice clinical system was possible.

## The appointment

The CVRA would last around 45 minutes and covered the following areas:

- collecting key demographic information on the participant including family history;
- questions on lifestyle for example alcohol consumption, smoking status, diet, physical activity etc;
- height, weight and waist measurement; and
- physical tests including blood pressure and pulse; point of care testing for cholesterol and \*blood glucose (HbA1c)

\*It should be noted that the approach to blood glucose testing varied: CTUHB routinely performed HbA1c POCT on all patients, ABUHB pre-screened using the Diabetes UK tool and ABMUHB did not undertake blood glucose testing during the CVRA.

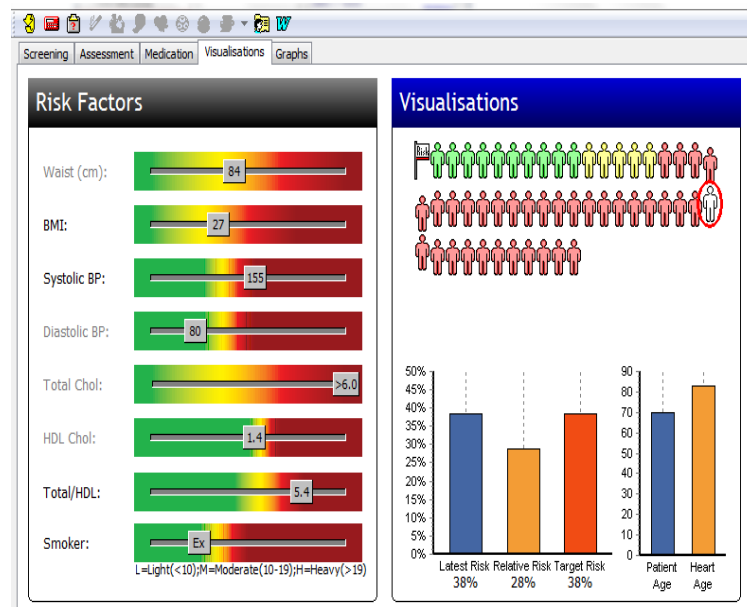
Menu driven software programmes designed specifically for CVRAs were used. ABUHB, HDUHB and ABMUHB all used software provided by Health Diagnostics. CTUHB used software provided by *Informatica*.

Participants were given their results on the day of the assessment. This included a visual presentation of risk – showing their heart age and information on their likelihood of developing a heart attack or stroke (Figure 13). The CVD risk score could be adjusted (as a form of motivational tool) to show if people made changes to their lifestyle such as increasing physical activity or stopping smoking – how their heart age could be improved and their risk reduced.

Participants were then offered a range of personalised advice about how to lower their risk with lifestyle changes. This could include for example improving diet, losing weight, increasing physical activity or stopping smoking. Participants were able to be referred directly to or signposted to services to support these actions including national programmes such as Help Me Quit or the National Exercise Referral Scheme (NERS). Depending on the services in each local health board area local services could also

be offered to participants. Participants were given a copy of their results and any relevant supporting information to support their individual actions.

**Figure 13: Visual presentation of risk (CTUHB) and Personal Health Report (ABUHB)**





If participant test results hit certain 'trigger' points for blood pressure, irregular pulse, HbA1c or cholesterol they were referred for follow up in their GP practice. Follow up appointments in primary care would determine what actions were required such as additional tests to determine whether for example medication needed to be prescribed.

A summary of the results of the CVRA were recorded in the participants GP medical records – contemporaneously in CTUHB and transmitted electronically via the software programme in the other health boards.

The differences in the Cwm Taf UHB and Aneurin Bevan UHB approaches are identified and discussed in Table 1.

**Table 1: Comparison of Inverse Care Law Cardiovascular Risk Assessment programmes in Aneurin Bevan and Cwm Taf**

Criteria	Cwm Taf	ABUHB (ABMU and Hywel Dda based on this approach)	Comment
<b>Programme Brand</b>	Known as  Cwm Taf Health Check  	Known as  <i>Living Well, Living longer</i>  	
<b>Eligibility &amp; invitation process</b>	<p>Male and female; Age 40-74</p> <p>Exclude patients on CVD Register (Quality and Outcomes Framework) i.e. include patients <b>with no</b> previous diagnosis of:</p> <ul style="list-style-type: none"> <li>Coronary heart disease</li> <li>Chronic kidney disease (CKD stages 3-5)</li> <li>Diabetes</li> <li>Previous CVA (stroke)</li> <li>Hypertension</li> <li>Atrial Fibrillation</li> <li>Transient Ischaemic Attack (TIA)</li> <li>Heart Failure</li> <li>Peripheral Arterial Disease</li> <li>Familial Hypercholesterolemia</li> </ul> <p><b>Pre-invitation QRisk 2 score estimated by software for each patient (utilising existing data in patient record)</b></p> <p>Invitation generated by HCSW and sent from practice; priority based on initial estimated QRisk2 score</p>	<p>Male and female; Age 40-64</p> <p>Exclude patients on CVD Register (Quality and Outcomes Framework)</p> <p><b>No pre-invitation CVD risk stratification; area deprivation (WIMD quintiles 1 &amp; 2) used as a proxy of need.</b></p> <p>Practice generate and provide list of names and addresses of eligible patients; LWLL</p>	<p><i>The NHS Health Check and NICE guidance adopt a 40-74 age range; decision to reduce to 64 in ABUHB based on potential impact of intervention and years of life gain.</i></p> <p><i>A means of identifying patients in greatest "need" should be part of the programme to ensure that the programme targets these individuals in line with NICE CG181. Postcode approach introduced ecological fallacy (area level deprivation measure may not accurately reflect deprivation at individual level)</i></p> <p><i>SAIL analysis demonstrates similar attendance of deprived populations with both the postcode and estimated CVD risk stratification approaches to invitation.</i></p> <p><i>* invitation from location outside the practice does not directly</i></p>

Criteria	Cwm Taf	ABUHB (ABMU and Hywel Dda based on this approach)	Comment
	<p>stratification (High, Medium, Low with missing data)</p> <p>Address/ Deprivation quintile not used specifically but postcode is included in estimated QRisk2 score</p>	<p>team send letters and book appointments from central LWLL programme office.</p> <p>Invitation sent to patients resident in postcodes corresponding to WIMD deprivation quintiles 1 (most deprived) and 2 (next most deprived) only</p>	<p><i>generate an "invitation to CVRA" READ code in practice patient record which would then allow for subsequent extraction via Audit + for analysis and evaluation purposes</i></p>
<b>Software (use during CVRA)</b>	<p><i>Health check+</i> through licence with <i>Informatica</i> (previously <i>BMJ Informatica</i>) arranged via NWIS.</p> <p>Menu driven Software sits on the Audit + platform on GP Clinical Systems.</p> <p>Features include illustration of risk and heart age, identification of personal priorities and production of a personal report.</p> <p>Data captured during the practice based CVRA is coded directly to the patient record.</p>	<p>Customised menu driven software was procured by ABUHB from <i>Health Diagnostics</i> to support the risk assessment.</p> <p>Features include illustration of risk and heart age, identification of personal priorities and production of a personal report and plan.</p> <p>The software allows the data collected in community setting, including test results, to be transferred directly to the GP clinical system within 48 hours of the assessment taking place.</p>	<p>Essential criteria for software include:</p> <ul style="list-style-type: none"> <li>Risk stratification tool;</li> <li>Menu-based (to be used by HCSW);</li> <li>Visually compelling;</li> <li>Flexible to be modified e.g. incorporate additional questionnaire;</li> <li>Able to print off a personal plan;</li> <li>Mobile (accommodate Practice or community setting - if used remote from practice then data can be mapped across to practice);</li> <li>Central reporting facility to monitor activity etc (metrics to be decided).</li> </ul>
<b>Software (Central Reporting)</b>	<p>Each of the local programmes has its own monitoring facility/ dashboard;</p> <p><i>Health Check Central</i> provided by <i>Informatica</i></p>	<p>Each of the local programmes has its own monitoring facility/ dashboard;</p>	<p>Proposal for NWIS to create a central dashboard for CVRA activity accessible via Primary Care Portal</p>

Criteria	Cwm Taf	ABUHB (ABMU and Hywel Dda based on this approach)	Comment
<b>Blood tests</b>	Point of Care testing used for HbA1c and Lipids  All patients have HbA1c; Diabetes UK risk calculator introduced to software December 2018	Point of Care Testing used for HbA1c and Lipids  Only patients identified by Diabetes UK risk calculator (incorporated in software) are offered HbA1c POCT.	No HbA1c undertaken in ABMU programme  Reduced use of HbA1c should reduce cost in CT without reducing pick up of diabetes and pre-diabetes
<b>Risk Assessment Tool used during CVRA</b>	QRisk2 – giving % risk of CVD over next 10 years	QRisk2 – giving % risk of CVD over next 10 years	Risk tool should reflect deprivation and ideally report both lifetime risk and 10 year risk. Expert Group to advise on preferred risk tool (likely to be JBS3).  Most up to date version of preferred tool should be deployed in the software.  Software can use any tool subject to necessary licence fee.
<b>Lifestyle Intervention</b>	Impact of lifestyle on CVD risk explained; assess readiness to change with brief intervention Referral to SSW (HMQ), NERS, Alcohol; <b>limited options</b> for Weight Management; Use of BHF literature	CVD risk explained; assess readiness to change with brief intervention Referral to SSW (HMQ), NERS, Alcohol, Weight Management support in the community; Use of BHF literature	Availability of community support and services is fundamental to successful intervention; lack of weight management services a major problem in CTUHB
<b>Location</b>	Practice based	Community based	Merits in both approaches, should reflect local situation (e.g. availability of space in practice, cost and acceptability of community venues)  SAIL and local programme data indicates minimal difference in attendance
<b>Clinical Management</b>	HCSW trained to do BP, ECG, phlebotomy	HCSW undertake POCT only;	Differences in approach arising from ability of HCSW in practice

Criteria	Cwm Taf	ABUHB (ABMU and Hywel Dda based on this approach)	Comment
	<p>If indicated baseline (venous) bloods taken by HCSW during CVRA.</p> <p><b>Appointment made at the time for practice follow up</b> for blood pressure monitoring, HbA1c and ECG, GP or nurse appointment as appropriate</p>	<p>Ambulatory BP Monitoring provided</p> <p>Email communication to practice of CVRA result. <b>Practice expected to initiate follow up for:</b></p> <ul style="list-style-type: none"> <li>• Blood investigations</li> <li>• HbA1c</li> <li>• ECG</li> </ul>	<p>setting to have closer contact with GP/Nurse, be part of practice team and take baseline venous bloods in case statins are started, suspicion of diabetes etc.</p> <p>Beneficial to have fewer steps for patient to make follow-up appointment in practice</p>
<b>Lifestyle Follow Up by Health check/ CVRA Team</b>	<p>None</p> <p>(Follow up assessment at 6-months of patients with initial QRisk2 10-20% as part of pilot, but uptake was very low)</p>	Health Trainer support for 6 months for those with QRisk2 above 10%	Recognise potential value of motivational support from team, but mixed patient feedback; unclear as to preferred format.
<b>GP involvement / Continuity of Care</b>	<p>HB PCSU employed team of 5 HCSWs (AfC 3) and nurse (AfC 6) that run the health checks in practices. In the pilot some practices provided their own HCSW who were trained alongside the HB staff.</p> <p>Programme Manager (AfC 7)</p> <p>No LES for follow-up work</p> <p>Service Level Agreement with practices to cover accommodation and invitation costs.</p> <p>Payment of £5 per completed health check</p>	<p>Dedicated HCSW team of 10 HCSW (AfC3), and nurse employed by the Primary Care &amp; Network Division.</p> <p>Programme manager (AfC 8)</p> <p>Follow up work for GP practices covered via LES</p> <p>One-off payment to practice of £250 for generation of patient list plus £5 per completed health check</p>	Centrally employed team of trained HCSWs (PCSU) is most practical model, The remuneration arrangements for GP involvement are different and will need to be reviewed going forward.



## 10. Learning from Inverse Care Law Programme (2015-18)

### 10.1 The programme

Much has been learned from undertaking this programme and key points are captured in this report. The programme demonstrated:

- the feasibility and value of utilising an affordable, and readily available and appropriately-trained primary care-based workforce resource to enhance the identification of previously unrecognised cardiovascular disease risk and signpost into existing lifestyle and/or clinical interventions aiming to modify such risk.
- that many preventive activities that were traditionally performed by registered primary care staff can be successfully taken on by Healthcare Support Workers (or other similar roles) working within a prudent, robust framework of governance, training and management. The success of this approach has possible application to many other areas of primary care transformation through the primary care strategic programme
- successful development and delivery of a social model of CVRA delivered by appropriately trained Health Care Support Workers, providing capability and capacity to GP practices to implement national guidance (NICE CG181) with pace and at scale
- ability to link into Clinical Pathways with appropriate clinical governance arrangements
- (from patient feedback) that those who attend the 40 minute CVRA appointment like the experience, although as many as 50% of those invited do not take up the offer, which is a key area for further exploration
- feasibility of undertaking CVRA with full use of software in GP practice premises, other health care settings and community venues with minimal difference in uptake
- that models developed in one health board can be adapted and implemented successfully in other health boards. However, the imperative to roll out the programme before a full evaluation had been conducted meant that

opportunities were missed to strengthen the programme at its foundation and in its linkages with services/initiatives aimed at changing disease risk

- development of a range of products:
  - Training programmes and operational manuals for Health Care Support Workers undertaking CVRA in conjunction with the British Heart Foundation (BHF).
  - CVRA Software tailored for Wales – for use in both Practice and Community settings
  - Publicity and patient materials
- Primary care and public health working together with wider partners with shared objective of improving population health; providing opportunity for practices to make contact with patients who otherwise wouldn't attend the surgery or take interest in their health and wellbeing; providing additional capacity to practices enabled them to take an active interest in CVD prevention and social referral
- that the availability of services to support lifestyle change is key – lack of low level weight management support service being a serious concern

## 10.2 The evaluation of impact

The programme has:

- provided a unique experience of using SAIL to evaluate a complex intervention where:
  - Parallel local monitoring of data provided comparison
  - Data governance agreement with practices and data transmission posed challenges
- identified challenges in accessing data at individual patient level from lifestyle support services e.g. NERS which limited realisation of the unique data linkage feature of the SAIL technology
- delivered in excess of 25,000 cardiovascular risk assessments between February 2015 and May 2018.
- successfully targeted inverse care by reaching more deprived populations. For example, 94% patients attending CVRA live in areas that fall into deprivation quintiles 1,2 or 3

- successfully identified lifestyle and clinical risk factors and advised or directed patients to further assessment, accordingly. Offer of access to good quality risk modifying health care has been demonstrated but there are gaps in the availability and consistency of services across health boards
- Whilst indications are good, longitudinal outcome data at individual patient and population level will be required to establish whether the programme has successfully modified risk of CVD and led to reduced CVD (and all cause) morbidity and mortality in those individuals.
- At this current time, we are not able to capture the results /risk modification outcomes from lifestyle referrals and activity including;
  - Weight loss following referral to and participation in a weight management programme
  - Number of people who have quit smoking following referral to *Help Me Quit* or other programmes including Community Pharmacy and self-help
  - Increased physical activity/weight loss following referral and participation in the NERS programme or other local programme.

## 11. Data Analysis Methodology

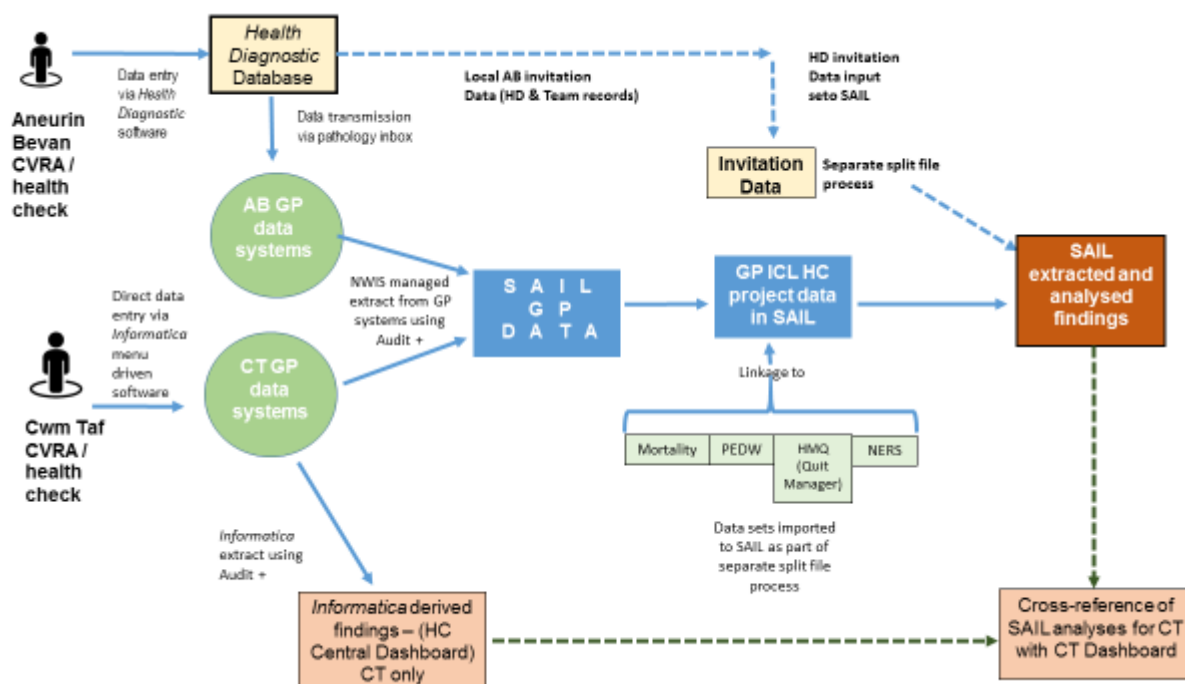
Cardiovascular Risk Assessment activity was monitored locally by each programme team. In Cwm Taf the *Informatica Health Check+* software used was a module on the Audit + platform of GP Clinical systems. The menu driven software enabled pre-selected READ codes to be recorded into the GP patient record at the time of the practice based Cardiovascular risk assessment (CVRA) / Health check. Monitoring (activity and outcome data) was provided by weekly extractions of the GP records presented as non-patient identifiable data on a *Health check central* dashboard.

ABUHB, ABMU and HDUHB CVRA/ health checks used *Health Diagnostics* software on independent laptops in community settings. Data from the CVRA /Health check was transmitted to the GP practice at the end of each session, supported by email communication as appropriate. Activity reports were provided to the local team by *Health Diagnostics*.

### **SAIL Dataset**

As part of a planned evaluation, information governance agreement was secured to extract primary care data and anonymously link to other data sets via the SAIL database. This would have the potential to provide data linkage to lifestyle service databases e.g. NERS and Stop Smoking Wales (Help Me Quit) creating a comprehensive dataset with outcomes that could be studied longitudinally. Quite uniquely, the programme approach and software used in CT afforded a second dataset with which to compare the SAIL extracted data.

**Figure 14: Data flow**



There were many challenges presented by this approach including:

- GP agreement to share data with SAIL
- Transmission of data to SAIL via NWIS
- Timely access and availability of the lifestyle service databases in a suitable format
- Transmission of Health Diagnostics activity data into primary care data systems and subsequently into SAIL
- A problem with missing invite codes within Aneurin Bevan GP data requiring this to be input separately

During the course of the programme, most of the above have been or are in the process of being resolved. There are however some gaps remaining in the analysis afforded by the latest SAIL (November 2018) whole programme data extraction. Given the method by which the records are generated by the practice based approach in Cwm Taf, more detailed and reliable data analysis have been possible for the CTUHB programme.

The analysis section of this report provides programme-wide data extracted from SAIL where this is available, Cwm Taf data where this is deemed more reliable, further supplemented by locally reported data.

The analyses of the data at this stage has sought to answer whether:

- *the programme has successfully targeted inverse care by reaching more deprived populations who have higher prevalence of risk factors?*
- *the identification of risk factors – lifestyle and clinical – has been successfully responded to by offering access to good quality risk modifying health care or other services?*

A longer period of longitudinal analysis of the dataset will be required to determine whether the programme has successfully modified risk of CVD in those individuals, leading to reduced CVD (and all cause) morbidity and mortality.

The analyses have focused on the following areas:

- Reach - Attendance profile and uptake of the programmes (by deprivation, age and sex);
- Prevalence of risk factors in the patients having CVRA/ Health check
- Offer of risk modification referrals or clinical management (in line with NICE Guidance)

## 12. Data Analysis

### **Headlines**

#### **Reach**

There were in excess of 25,000 CVRA / health checks performed across the four health boards during the period Feb 2015 to May 2018, which represents a programme-wide uptake of 41.7%.

Consistent with other programmes, data for CTUHB identified there was a better uptake among older age groups and women. Uptake was highest among less deprived invitees, but the gap between most and least deprived was narrower in Wales suggesting the inverse care law is being addressed.

#### **Identification of risk factors, referral and management**

- **Smoking**
  - 20 in 100 attending CVRA were smokers
    - of which 4 in 10 were referred to smoking cessation services
- **Weight/physical activity**
  - 70 in 100 attending CVRA were overweight or obese
    - of which 4 in 100 were referred to weight management services
    - and 9 in 100 were referred to physical activity services
- **Cholesterol**
  - 10 in 100 attending CVRA had elevated cholesterol
    - of which 1 in 5 were subsequently prescribed statins (at 3 months)
- **Diabetes**
  - 3 in 100 having HbA1c test had an elevated result
    - of which 1 in 3 were subsequently diagnosed with diabetes (at 3 months post CVRA)
- **Blood Pressure**
  - 20 in 100 attending CVRA had elevated blood pressure
    - of which 1 in 5 were subsequently prescribed antihypertensive drugs (at 3 months post CVRA)

We are not currently able to capture the results /risk modification outcomes from lifestyles referrals and activity including;

- Weight loss following referral to and participation in a weight management programme.
- Number of people who have quit smoking following referral to Help Me Quit or other programmes including pharmacy and self-help.
- Increased physical activity/weight loss following referral and participation in the NERS programme or other local programme.

The data that follows relates to the four health board programmes. It includes locally reported data and that extracted from GP clinical systems into the SAIL database. It covers the period February 2015 to May 2018. The ABMU and HDUHB programmes commenced during 2017 and as such ABUHB and CTUHB combined make up 88% of all CVRAs undertaken during the study period.

## 12.1 Reach of the ICL programme

Measures used to estimate delivery and impact of Health Check programmes include coverage and uptake:

**Coverage** is defined as the proportion of eligible population who have attended a Health Check/ CVRA<sup>8</sup>.

**Uptake** is defined as the proportion of those invited who have attended a Health Check/ CVRA<sup>1</sup>.

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<sup>8</sup> Martin A et al Br J Gen Pract 2018; 68 (672): e449-e459. DOI: <https://doi.org/10.3399/bjgp18X697649>  
Accessed 21 March 2019



## Eligible Population

The eligible population in CTUHB is defined as patients aged 40-74 years, not on a CVD register who had an initial estimated 10 year CVD risk which was high (>20%); Medium (10-20%) or low (<10% with missing data).

The eligible population in ABUHB and ABMUHB is defined as patients age 40-64 years, not on a CVD register and lived in the three most deprived quintiles (Q1 and 2)

Health check “coverage” in Wales is the same as “uptake” as all of the eligible patients were invited.

### 12.1.1 Uptake of the CVRA across the four Health Boards

Calculation of uptake is dependent on both invitation and attendance data which was reported by local programmes (table 1). More detailed SAIL analysis of uptake were possible for Cwm Taf programme only.

Across the four health boards operating the ICL programme during the period Feb 2015 to May 2018 there were in excess of 25,000 health checks performed which represents a programme-wide coverage and uptake of 41.7%. The other health board programmes with the exception of HDUHB – had broadly similar uptake rates.

The NHS England Health Check programme between April 2009 and March 2013 had a national coverage of 12.8% <sup>9</sup>; national uptake that varied between 47.9% in 2015-16 to 49.0% in 2013-14 (ranging from 20.1% in East Riding, Yorkshire to 100% in Leicester<sup>1</sup>).

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<sup>9</sup> Robson J, et al. The NHS Health Check in England: an evaluation of the first 4 years BMJ Open 2016;6

**Table 1: Uptake by Health Board**

Health Board	Number invited (N)	Number had Health Check/CVRA (n)	Uptake % (95% CI's)
<b>Combined</b>	60,652	25,318	41.7 (41.4, 42.1)
<b>ABUHB</b>	35,210	15,218	43.2 (42.7, 43.7)
<b>CTUHB*</b>	16,814	7,033	41.8 (41.1, 42.6)
<b>ABMUHB</b>	3,450	1,458	42.3 (40.6, 43.9)
<b>HDUHB</b>	5,178	1,609	31.1 (29.8, 32.3)

Source: Programme data (Feb 2015 – end May 2018); analysis undertaken by Cardiff University  
Further analysis was undertaken of the attendance and uptake by age, sex and deprivation (WIMD quintile).

## 12.2 Analysis by deprivation

### 12.2.1 Attendance Profile

By identifying people who are at high risk of having a heart attack or stroke the ICL programme can help to tackle health inequalities, as the burden from early death from CVD is known to be higher in the most deprived communities compared to the least deprived. Crucial to the addressing of inequalities and inverse care law is the reach within the more deprived communities.

Analysis of the data in SAIL identifies that 94% of patients who had a CVRA are resident in quintiles 1, 2 and 3. It should be noted that HDUHB selected and invited participants without applying deprivation criteria and it can be seen from table 2 that participants attended from across the five quintiles with greater attendance from least deprived areas.

**Table 2: Distribution of Attendees by deprivation**

HB	Number had Health Check/CVRA	Q1 (most deprived)	Q2	Q3	Q4	Q5 (least deprived)
<b>Combined</b>	17,080	39.71	35.02	19.23	4.54	1.5
<b>ABUHB</b>	9,397	39.8	40.9	14.9	3.4	1.0
<b>CTUHB</b>	5,951	42.61	29.93	20.16	4.52	2.77
<b>ABMUHB</b>	1,373	***	23.6	38.82	0.66	0.15
<b>HDUHB</b>	1,373	-	NA	41.23	49.3	-

Source: SAIL, (Feb 2015 – end May 2018), using WIMD for quintiles; analysis completed by Cardiff University \*\*\* data suppressed

### 12.2.2 Uptake profile

Uptake data by deprivation within SAIL for CTUHB programme (Table 3 and Figure 1) identifies uptake across all 5 quintiles, with statistically significantly higher uptake in the least deprived quintiles and lower in the most deprived quintile. The smaller numbers invited in the least deprived quintiles are likely to be a reflection of the widespread socioeconomic deprivation in CTUHB and invitation based on estimated risk.

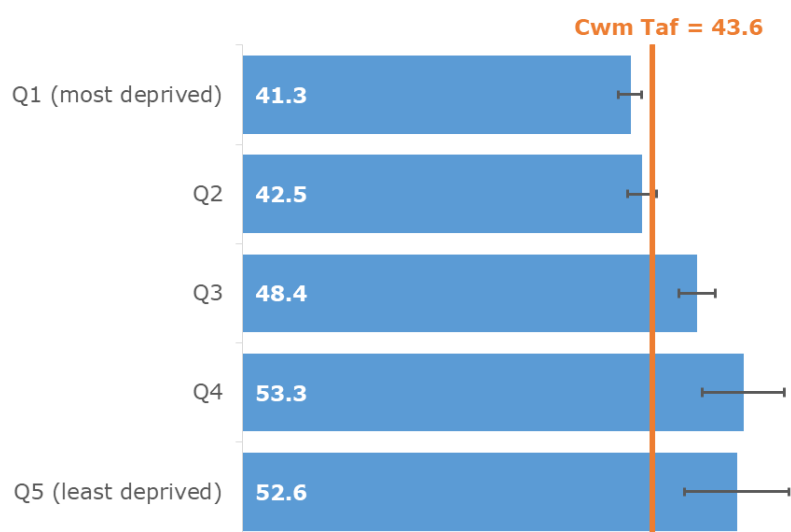
**Table 3: Uptake by Deprivation, CTUHB**

Quintile (WIMD)	Number invited (N)	Number had Health Check/ CVRA (n)	Uptake (%)	95%CI
<b>Q1 (most deprived)</b>	6,146	2,535	41.25%	(40.02,42.48)
<b>Q2</b>	4,187	1,780	42.51%	(41.02,44.01)
<b>Q3</b>	2,481	1,200	48.37%	(46.40,50.33)
<b>Q4</b>	505	269	53.27%	(48.92,57.62)
<b>Q5 (least deprived)</b>	314	165	52.55%	(47.02,58.07)
<b>Total</b>	13,633	5,949	43.64%	(42.80,44.47)

Produced by Cwm Taf UHB using SAIL data analysed by Cardiff University

\*Deprivation is based on WIMD 2011; activity takes place after WIMD 2014 was introduced. The deprivation score may not represent the deprivation at the time of invite/health check.

**Figure 15: Uptake by deprivation quintile, CTUHB**



Produced by Cwm Taf UHB using SAIL data analysed by Cardiff University

Whilst the attendance data indicated that there was good representation from the more deprived areas relative to least deprived, uptake of invitation for Cwm Taf was highest among least deprived areas. This highlights the challenge of reaching more deprived communities.

It is anticipated that further work on the SAIL database will enable uptake by deprivation across the other health boards in the programme to be available in the next data extraction.

## 12.3 Analysis by age

### 12.3.1 Attendance Profile

**Table 4: Attendance by age group, 4 Health boards combined**

	Number had Health Check/ CVRA (n)	% had Health Check
<b>Total</b>	17,722	
<b>40-49</b>	6,433	36.3 (35.59, 37.01)
<b>50-59</b>	6,831	38.5 (37.84, 39.27)
<b>60-64</b>	2,472	13.9 (13.45, 14.47)
<b>65-69</b>	1,251	7.1 (6.69, 7.45)
<b>70-74</b>	733	4.1 (3.86, 4.44)

Produced by Cwm Taf UHB using SAIL data analysed by Cardiff University

The 17,722 CVRAs undertaken are spread across the age groups, noting that the 65-74 age groups were only undertaken in CTUHB.

**Table 5: Attendance by age group, individual health boards (N=17,722)**

	ABUHB		CTUHB		ABMUHB		H DUHB	
	(n)	% of total	(n)	% of total	(n)	% of total	(n)	% of total
<b>Total</b>	9,781	--	6,107	--	1,441	--	393	--
<b>40-49</b>	4,429	45.3	1,316	21.5	570	39.6	118	30.0
<b>50-59</b>	4,166	42.6	1,802	29.5	665	46.1	198	50.4
<b>60-64</b>	1,163	11.9	1,031	16.9	202	14.0	***	--
<b>65-69</b>	***	--	1,224	20.0	***	--	***	--
<b>70-74</b>	***	--	732	12.0	***	--	--	--

Produced by Cwm Taf UHB using SAIL data analysed by Cardiff University

n=Number had Health Check/CVRA

### 12.3.2 Uptake profile by age

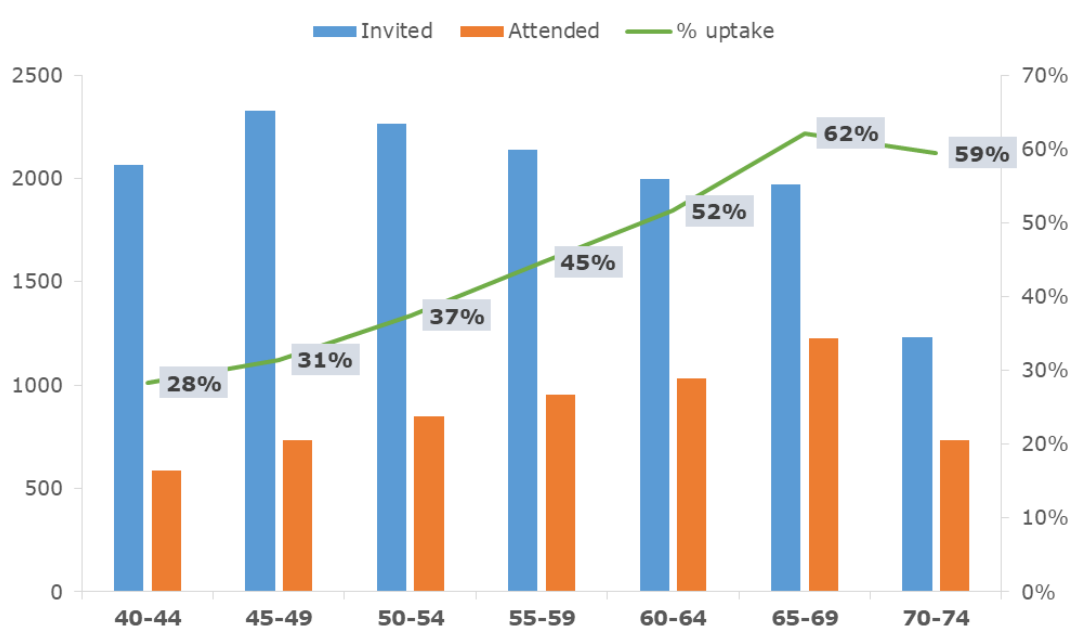
Uptake by Age is available for Cwm Taf programme only and identifies highest uptake in the 65+ age group (62%) and lowest in the 40-44 yrs (28%)

**Table 6: Uptake by age band**

Age Band	Number invited (N)	Number had Health Check/ CVRA (n)	Uptake	CI
<b>Total</b>	13,990	6,105	43.64%	(42.81,44.46)
<b>40-44</b>	2,065	585	28.33%	(26.39,30.27)
<b>45-49</b>	2,326	731	31.43%	(29.54,33.31)
<b>50-54</b>	2,263	847	37.43%	(35.43,39.42)
<b>55-59</b>	2,139	955	44.65%	(42.54,46.75)
<b>60-64</b>	1,996	1,031	51.65%	(49.46,53.85)
<b>65-69</b>	1,970	1,224	62.13%	(59.99,64.27)
<b>70-74</b>	1,231	732	59.46%	(56.72,62.21)

Produced by Cwm Taf UHB using SAIL data analysed by Cardiff University

**Figure 16: Uptake by age range, CTUHB**



Produced by Cwm Taf UHB using SAIL data analysed by Cardiff University

## 12.4 Analysis by Sex

### 12.4.1 Attendance profile

**Table 7: Attendance by sex**

Health Board	Men (%)	Women (%)
<b>ABUHB</b>	46.1	53.9
<b>CTUHB</b>	57.0	43.0
<b>ABMUHB</b>	45.9	54.1
<b>HDUHB</b>	40.2	59.8
<b>ALL</b>	49.7	50.3

SOURCE: SAIL; Analysis by Cardiff University

Across the four programmes there is broadly a 50/50 split between men and women who completed their CVRA. There are noticeable differentials in certain health boards – in CTUHB, 57% of completed assessments were in men and 43% in women, whilst in HDUHB the opposite is true; just under 60% completed CVRAs in women and 40% in men.

Attendance and completion of CVRA by sex and age for CTUHB identifies similar numbers of men and women attending overall and that men aged 50-65 are well represented (Table 8).

### 12.4.2 Uptake by age and sex

The Uptake of health check invitation in CTUHB increases with age, and is higher in women than men between ages 40-50 and the reverse is true for 60-70 year olds (Figure 17). This pattern may indicate difficulty for men of working age to attend the CVRA or perhaps a lower level of interest in their health.

Invitation to CVRA was based on estimated risk; more men than women were invited indicating that overall estimated risk is higher in men. There was also a higher attendance among men. However, rates of invitation uptake in men were generally lower than women.

**Table 8: Uptake by age and sex (CTUHB)**

Age band	Sex	Number invited (N)	Number had Health Check/ CVRA (n)	Uptake (%)	95%CI
<b>Total</b>	Male	8,164	3,476	42.58%	(41.5, 43.65)
	Female	5,826	2,629	45.13%	(43.85, 46.4)
<b>40-44</b>	Male	1,217	330	27.12%	(24.62, 29.61)
	Female	848	255	30.07%	(26.98, 33.16)
<b>45-49</b>	Male	1,412	403	28.54%	(26.19, 30.90)
	Female	914	328	35.89%	(32.78, 39.00)
<b>50-54</b>	Male	1,372	514	37.46%	(34.90, 40.02)
	Female	891	333	37.37%	(34.20, 40.55)
<b>55-59</b>	Male	1,387	617	44.48%	(41.87, 47.10)
	Female	752	338	44.95%	(41.39, 48.50)
<b>60-64</b>	Male	1,218	642	52.71%	(49.91, 55.51)
	Female	778	389	50.00%	(46.49, 53.51)
<b>65-69</b>	Male	1,022	658	64.38%	(61.45, 67.32)
	Female	948	566	59.70%	(56.58, 62.83)
<b>70-74</b>	Male	536	312	58.21%	(54.03, 62.38)
	Female	695	420	60.43%	(56.80, 64.07)

Produced by Cwm Taf UHB using SAIL data analysed by Cardiff University



**Figure 17: Uptake of health checks by age and sex**



Produced by Cwm Taf UHB using SAIL data analysed by Cardiff University

## 12.5 Comparison with other programmes

A systematic review of the delivery and impact of the NHS Health Check in the first 8 years by Martin et al<sup>10</sup> published in 2018 identified 12 studies where uptake was reported. Uptake varied substantially: Public Health England (PHE) website reported uptake of just under half (48.2%) for the whole of England (2013-14 to Q2 2016-17), ranging from 20.1% in East Riding, Yorkshire to 100% in Leicester. Where full year data were available, national uptake varied between 47.9% in 2015-16 to 49.0% in 2013-14.

Uptake in general practice studies (n=9) ranged from 27% (four practices in east of England) to 52.9% (13 practices in NW England). Uptake in community settings was 50.9% (a football ground) and 71.8% (a mental health unit).

Combined uptake across all four Health Boards was 41.7% (31.1% HDUHB to 43.2% ABUHB)

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<sup>10</sup> Martin A et al Br J Gen Pract 2018 68 (672): e449-e459. DOI: <https://doi.org/10.3399/bjgp18X697649>  
Accessed 21 March 2019

Five studies reported associations between patient characteristics and the likelihood of attending, using multivariable regression. These consistently showed that the odds of taking up an invitation increased significantly with age and lower deprivation. Of the five studies reporting associations between uptake and sex, four also showed females were more likely to take up invitations. The fifth, a study of 37 practices in Stoke on Trent reported the opposite with males more likely to take up invitations.

This is a similar pattern to that experienced in CTUHB.

Attwood et al<sup>11</sup> reported a trial set in four GP practices in East of England which invited 1380 patients; overall uptake was 27%; and odds ratio of most deprived quintile compared to least deprived was 0.42 (95% CI 0.2 to 0.88). This is compared to a ratio of most to least deprived of 0.79 in Cwm Taf. The range of uptake across the quintiles was narrower in CTUHB (41.3 to 52.6%) compared to comparator study (17.8% to 32%).

A further study by Sallis et al<sup>12</sup> identified that being in the least deprived quintile was significantly associated with attendance at the health check compared to the most deprived quintile (AOR 1.61, CI 1.14–2.26,  $p < 0.01$ ).

## 12.6 Prevalence of lifestyle and clinical risk factors and subsequent actions

Identification of lifestyle and clinical risk factors for CVD during the CVDRA and subsequent actions are summarised for each health board and overall programme in Table 9. This is illustrated further as a flowchart describing the decay from phase to phase for Cwm Taf UHB (Figure 4). More analytical detail is available in the technical SAIL report.

The variation in risk factor prevalence and outcomes reported by health board in the SAIL data (Table 9) is being explored further. The low conversion rates reported may be a data flow issue due to incomplete coding or transfer of data which is being tested.

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<sup>11</sup> Attwood et al Exploring equity in uptake of the NHS Health Check and a nested physical activity intervention trial. *J Public Health* 2016 38(3) 560-568

<sup>12</sup> Sallis et al The effectiveness of an enhanced invitation letter of uptake of NHS Health Checks in primary care a pragmatic quasi randomised controlled trial *BMC Fam Pract* 2016 17 35

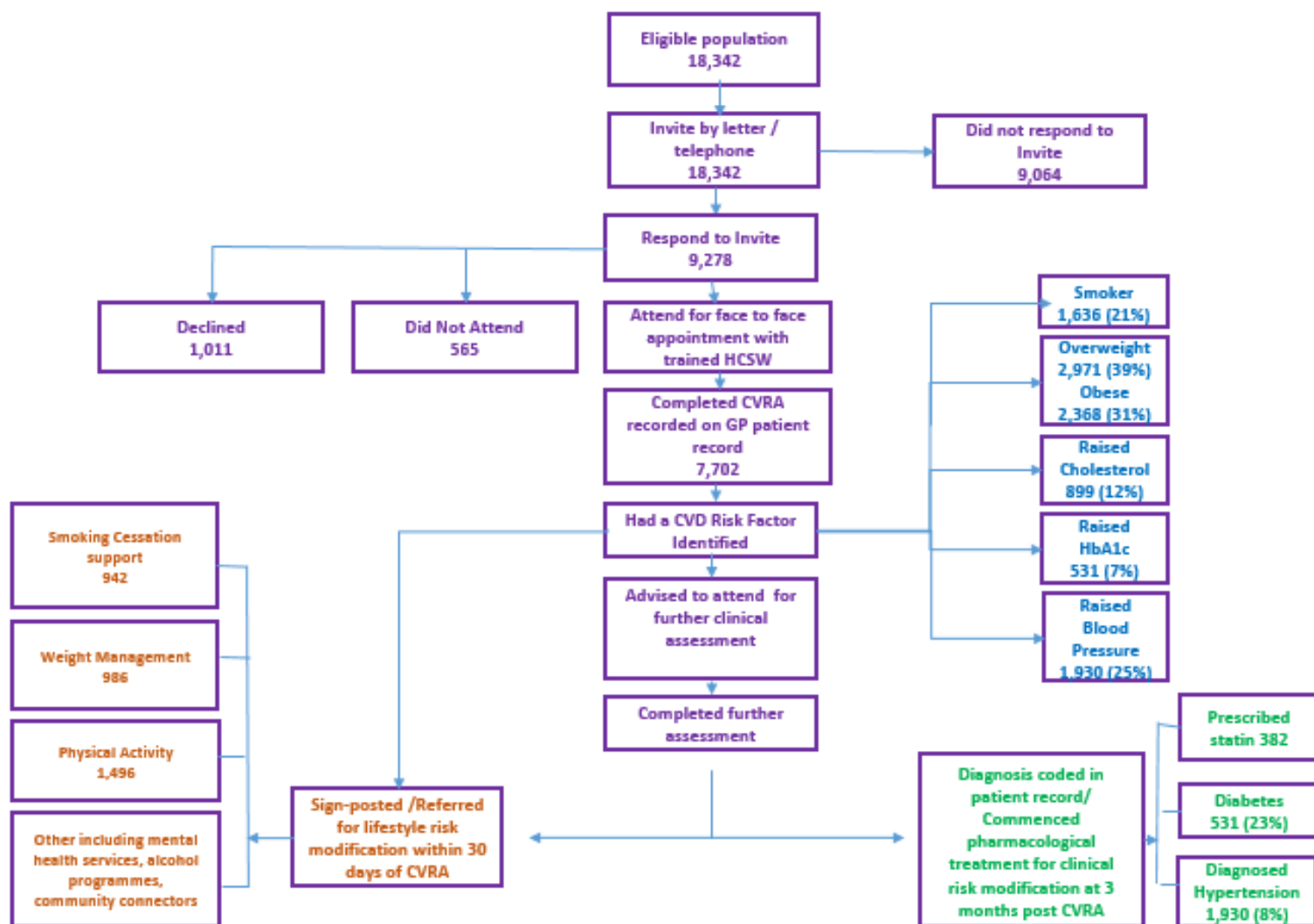
**Table 9: Summary of risk factor and outcomes by Health Board**

	Number had Health Check/ CVRA (N)	Smoker	Overweight or obese	High cholesterol (n <sub>1</sub> )	Prescribed a statin	Elevated HbA1c (n <sub>2</sub> )	Diagnosed diabetes	High blood pressure (n <sub>3</sub> )	Prescribed antihypertensive meds
<b>Combined</b>	17,722	3,590	12,964	1,858	431	182	65	3,834	617
		20% <sup>a</sup>	73% <sup>a</sup>	10% <sup>a</sup>	23% <sup>b</sup>	1% <sup>a</sup>	36% <sup>c</sup>	22% <sup>a</sup>	16% <sup>d</sup>
<b>ABUHB</b>	9,781	2,012	7,280	945	170	821	14	2,225	286
		21% <sup>a</sup>	74% <sup>a</sup>	10% <sup>a</sup>	18% <sup>b</sup>	8% <sup>a</sup>	2% <sup>c</sup>	23% <sup>a</sup>	13% <sup>d</sup>
<b>CTUHB</b>	6,107	1,296	4,322	782	244	131	51	1,057	350
		21% <sup>a</sup>	71% <sup>a</sup>	13% <sup>a</sup>	31% <sup>b</sup>	2% <sup>a</sup>	39% <sup>c</sup>	17% <sup>a</sup>	33% <sup>d</sup>
<b><u>kel</u>ABMUHB</b>	1,441	241	1,101	103	14	0	0	475	42
		17% <sup>a</sup>	76% <sup>a</sup>	7% <sup>a</sup>	14% <sup>b</sup>	0	0	33% <sup>a</sup>	9% <sup>d</sup>
<b>HDUHB</b>	393	41	261	28	<5	91	<5	77	9
		10% <sup>a</sup>	66% <sup>a</sup>	7% <sup>a</sup>	-	23% <sup>a</sup>	-	20% <sup>a</sup>	12% <sup>d</sup>

Source: SAIL data (% of completed CVRA or risk factor) Produced by Cwm Taf UHB

a: denominator=N;      b: denominator= n<sub>1</sub>;      c: denominator= n<sub>2</sub>;      d: denominator= n<sub>3</sub>

Figure 18: Cwm Taf UHB Programme Intervention – lifestyle risk factors, referrals and diagnoses (local programme data)



\*Elevated total cholesterol is  $\geq 7.5$  mmol/L  
or elevated total cholesterol: HDL ratio  $>6$

## 13. Participant Experience

Each programmes has undertaken their own satisfaction surveys in relation to those attending CVRAs – these demonstrate a high level of satisfaction, that people had a positive experience and would recommend the programme to others.



A small but more in depth survey (telephone based) was undertaken by ABUHB and CTUHB in late 2017 with a view to identifying learning from the programmes which would enable improvements to be made, if needed. Some key areas identified from this included:

### Overall experience

The majority of respondents in both ABUHB and CTUHB made positive comments about their CVRA experience. People liked the local setting, the friendly and knowledgeable staff, the range of tests performed and the sensible advice that they received.

## **Venues**

Some participants were less satisfied with community venues used in ABUHB – they cited that the atmosphere, lack of privacy and poor signposting for the community venues were factors which made them less satisfied. In contrast everyone was pleased with the GP surgery venues for the CTUHB Health Checks.

## **Low GP referral uptake in ABUHB**

Over half of the people who were referred back to primary care in ABUHB due to their blood pressure or cholesterol results did not follow up with their GP. They either did not get around to arranging the appointment, felt that the results were not serious enough to warrant review or that because they made behaviour changes they did not require follow up.

## **Uptake of lifestyle service referrals**

Of 9 respondents, no-one in ABUHB accepted a referral to a lifestyle service whilst nine people of those interviewed in CTUHB accepted a referral to NERS. In both ABUHB and CTUHB a number of people did not take up a lifestyle service referral that was offered either because they weren't ready to change, they felt they could manage the behaviour change themselves or they had competing priorities such as caring responsibilities or busy work schedules. Some people also self-referred to services such as smoking cessation and weight management services (e.g. Slimming World) following their CVRA.

## **Interest in further dedicated support and advice**

Of those interviewed in ABUHB, no one and only four people in CTUHB expressed interest in receiving further dedicated support and advice following their CVRA. This was despite people admitting to a wide range of unhealthy behaviours including smoking, poor diet, obesity and excess alcohol consumption. The majority of people did not feel that they would benefit from support or felt that they already had adequate support networks to allow them to make behaviour changes independently.

### **Interest in regular CVRAs**

Some people mentioned that they would be keen to have the CVRA repeated on a regular basis. They felt that this would help keep them informed of health issues and remind them about healthy behaviours.

### **Behaviour change**

The majority of people in both ABUHB and CTUHB self-reported some behaviour change following their CVRA with the most common changes being to their diet or exercise. A lot of these changes were small - such as swapping full fat milk for semi-skimmed milk, eating more oily fish or going for two dog walks a day instead of one. CVRAs also increased people's belief that they could make lifestyle changes and motivated them to make changes. These behaviour changes are not currently captured by the existing quantitative evaluation of the outcomes of the CVRA programme.

### **Non participation in CVRA**

A further much smaller survey was undertaken where people who had not responded to their CVRA invite were asked to participate in a survey to identify what the barriers and reasons had been for their non-participation in the ICL programme. This survey identified the following key factors:

### **Insufficient information about the Health Check**

People did not feel they had enough information about the CVRA before they attended.

### **Low perceived susceptibility to CVD**

People chose not to attend the CVRA as they felt that they were not at high risk from CVD although did admit risk increased with age.

**Barriers to attending an appointment**

Common barriers to attending the CVRA included not having the time, having work commitments, having caring responsibilities and not easily being able to access the venue for the appointment.

As well as undertaking a range of surveys, Annex 3 includes stories from participants of the ICL programme who have shown the positive changes that can be made after they attended their CVRA.



## 14. Recommendations

Valuable learning has been gained from undertaking this programme to date. It has demonstrated an ability to reach more deprived populations, in an effort to mitigate the effects of poverty on health and close the inequality gap. Despite good uptake and promising early outputs, there is more work to be done to encourage wider population engagement with this programme. In addition, greater focus is needed on the availability and sustainability of support services as well as refining the method of evaluating the impact of this approach over time.

### **Recommendation 1:**

Establish a detailed next phase of the national Inverse Care Law Programme in Wales that consolidates the model based on the valuable learning to date; the re-focused programme will inform the Primary Care Strategic Programme and contribute to the realisation of the prevention vision set out in a *Healthier Wales*. **Progressed by National Inverse Care Law Programme Board by end September 2020**

### **Recommendation 2:**

Explore the challenges posed by the evaluation of the programme with particular focus on addressing the weaknesses in the data architecture underpinning the programme. **Progressed by National Inverse Care Law Programme Board, PHW and Swansea University (SAIL) by end December 2019**

### **Recommendation 3:**

Explore opportunities for health economic evaluation of the programme and longitudinal research drawing on the strength of the SAIL database. **Progressed by the National Inverse Care Law Board by March 2020**

## Annex 1: National ICL Programme Development Board



### **National Inverse Care Law Programme Joint Programme Development Board**

**Terms of Reference  
December 2016**

# **Terms of Reference and Membership**

## **1.0 Purpose of the of the National Inverse Care Law Programme**

People in poverty are less likely to have access to high quality healthcare, despite the fact that they are likely to have greater need. This is referred to as the 'Inverse Care Law'. The Welsh Government has set out a target in the Tackling Poverty Action Plan to close the gap in Healthy Life Expectancy (HLE) in each deprivation fifth by an average of 2.5 per cent – by 2020.

Cardiovascular disease and cancer are the main causes of premature mortality in the population served by Aneurin Bevan and Cwm Taf University Health Boards. Both boards through their respective programmes (Living Well, Living Longer in ABUHB) will focus on embedding a sustainable system for reducing premature (under 75) mortality from cardiovascular disease in deprived communities.

The aim of the National Inverse Care Law Programme is to support each Health Board in Wales to develop and implement Cardiovascular Disease risk assessment pilot in a Cluster area by March 2018.

The initial focus of the programme is to support Health Boards in Wales to reduce premature mortality and emergency admissions from cardiovascular disease in deprived areas by improving the identification and management of cardiovascular risk factors.

£300k has been provided by the Heart Disease, Stroke and Diabetes Implementation Groups to support an all Wales approach.

The Aneurin Bevan University and Cwm Taf University Health Boards are working in partnership to develop a programme for cardiovascular risk assessment delivery, aligned with proportionate universalism, prioritising the needs of local population at cluster level, placing a strong focus on empowering positive modifiable health behaviours and increased health literacy.

Since its inception funding has been approved to roll the programme out to other Health Boards in Wales. This work is included in the scope section of this document.

The programme aims to address the impact of the inverse care law by:

- Working with Health Boards in Wales to develop and implement a sustainable, holistic cluster model of cardiovascular disease risk assessment, based on the evidence and learning from both the Aneurin Bevan University Health Board and Cwm Taf University Health Board models of delivery.
- Systematically delivering evidence based interventions in primary care at a scale that will achieve a percentage change in population outcome.

The aim is to have activity in every Health Board area in Wales by 2018, with initial work prioritised for the most deprived community areas. Each Health Board will have an agreed local programme approach which describes how this activity will be delivered for its population.

## **2.0 Scope of the National ICL Programme Board**

The National ICL programme will:

- Develop and oversee the progress of a Joint Welsh Government Delivery Agreement between Aneurin Bevan University Health Board and Cwm Taf University Health Board for the delivery of the National Inverse Care Law Programme;
- Provide support and mentorship to Health Boards in Wales to develop and implement a cluster based Cardiovascular Disease risk assessment programme to reduce premature mortality and emergency admissions from cardiovascular disease in deprived areas;
- Develop and provide Nationally agreed set of specifications for CVD risk assessment to support systematic and population scale implementation of proven evidenced based interventions that can demonstrate measurable outcomes;
- Agree and oversee the National Inverse Care Law Programme expenditure via robust financial monitoring as set out in the Welsh Health Board Business Case for the development and implementation of their Cluster based CVD risk assessment pilots;
- Enable the shared learning from the development and implementation from the Aneurin Bevan University Health and Cwm Taf University Health Board CVD risk assessment programmes;
- Develop and implement sustainable National solutions for data and technological support to underpin the delivery of the CVD risk assessment, enable effective and accurate performance management and evaluation mechanisms;
- Promote, identify and enable a programme of measure and evaluation which would include clinical outcome and cost effectiveness, and include co-production research methods of patient professional experience of the programme.

- Identify the determinants of inequalities that are within the control and influence of primary care and the Primary Care Clusters/ Locality Networks, that enable sustainable and effective improvements;

Cwm Taf and Aneurin Bevan University Health Boards have developed their own programmes of work and have their own governance arrangements to oversee local implementation and delivery, (Annex 1 & 2).

### **3.0 Role of the National ICL Programme Development Board**

The National ICL Programme Development Board will:

- Identify the learning from the ABUHB and CTUHB approaches as the other Health Board programmes are being developed and implemented;
- Identify where there are areas of benefit in taking a common approach enabling the best use of resources and opportunities;
- Oversee and monitor the work of the three sub-groups that work directly to the National ICL Programme Board, for data and technology, research and evaluation and expert stakeholder groups.
- Scrutinise and provide assurance that individual Health Boards are delivering against their approved Business Plans.
- Provide Welsh Government and respective Boards with reassurance of progress of the National ICL Programme via the Joint Welsh Assembly Government Delivery Agreement;
- Work with the Stroke, Heart Disease and Diabetes Delivery Plan Strategic Implementation Groups to support the delivery of the prevention arm of the National Delivery plans;
- Liaise with the expert reference forum to discuss and resolve methodological and clinical queries drawing on the experience, knowledge and advice of experts e.g. clinicians, Third Sector organisations, health inequalities experts, Academia, PHW Links, WG, PHW etc.;
- Through Academic links ensure and enable robust evaluation and research of the work undertaken, to ensure consistent, dynamic responses to changes in clinical guidance and practice;

There are four distinct work streams for the delivery of the National ICL Programme (Annex 3).

## 4.0 Membership

The membership of the National ICL Programme Development Board is as follows:

### Aneurin Bevan UHB

Phil Robson (Co-Chair)	Vice Chair Aneurin Bevan University Health Board
Dr Gill Richardson	Executive Director of Public Health Aneurin Bevan University Health Board
Dr Sarah Aitken	Consultant in Public Health Medicine - Aneurin Bevan Public Health Team, Public Health Wales
Dr Liam Taylor	Deputy Medical Director - Primary Care and Networks, Aneurin Bevan Health Board
Dee Puckett	Programme Manager – Living Well Living Longer / National ICL Programme
Dr Nigel Brown	Consultant Cardiologist - Aneurin Bevan Public Health Team
Sheena Jones	Senior Programme Officer – Living Well Living Longer

### Cwm Taf UHB

Professor Donna Mead (Co- Chair)	Vice Chair Cwm Taf University Health Board
Dr Kelechi Nnoaham	Director Public Health Cwm Taf University Health Board
Dr Naomi Stanton	Locality Clinical Director / GP
John Palmer	Director Primary Care, Community and Mental Health
Sara Thomas	Consultant in Public Health, Cwm Taf Public Health Team

Victoria Norman	Programme Manager
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## **Welsh Government**

Irfon Rees	Deputy Director Public Health Division, Welsh Government
Martin Davies	Communities First Programme Integration Manager, Welsh Government
Andrew Griffiths	Director of NHS Informatics Services, NWIS

## **Powys University Health Board**

Dr Karen Gully	Medical Director
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## **All Wales Cardiac Network**

Tracey Hill	Network Manager
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The Board will be co-chaired by Phil Robson & Professor Donna Mead.

The Board will meet quarterly, alternating venues between ABUHB and CTUHB and hold development workshops as appropriate

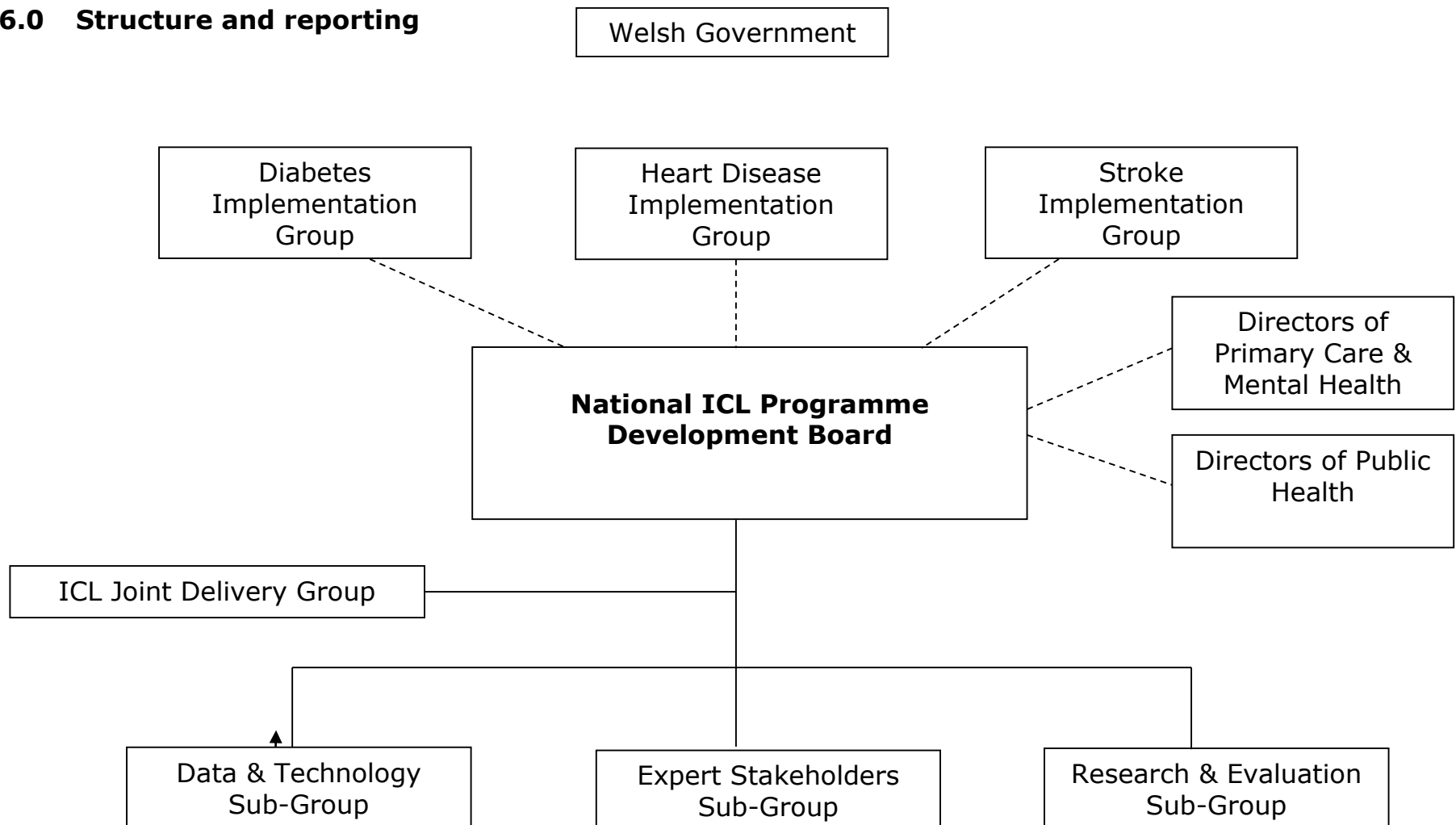
The Programme Board will be facilitated by the ABUHB Programme Support Team that will support this programme of work.

Minutes and an action log will be used to record an accurate account of the meetings. These will be shared with members on a ten working day turnaround, to enable completion of actions between meetings.

## **5.0 Review**

These terms of reference will be subject to review on an annual basis.

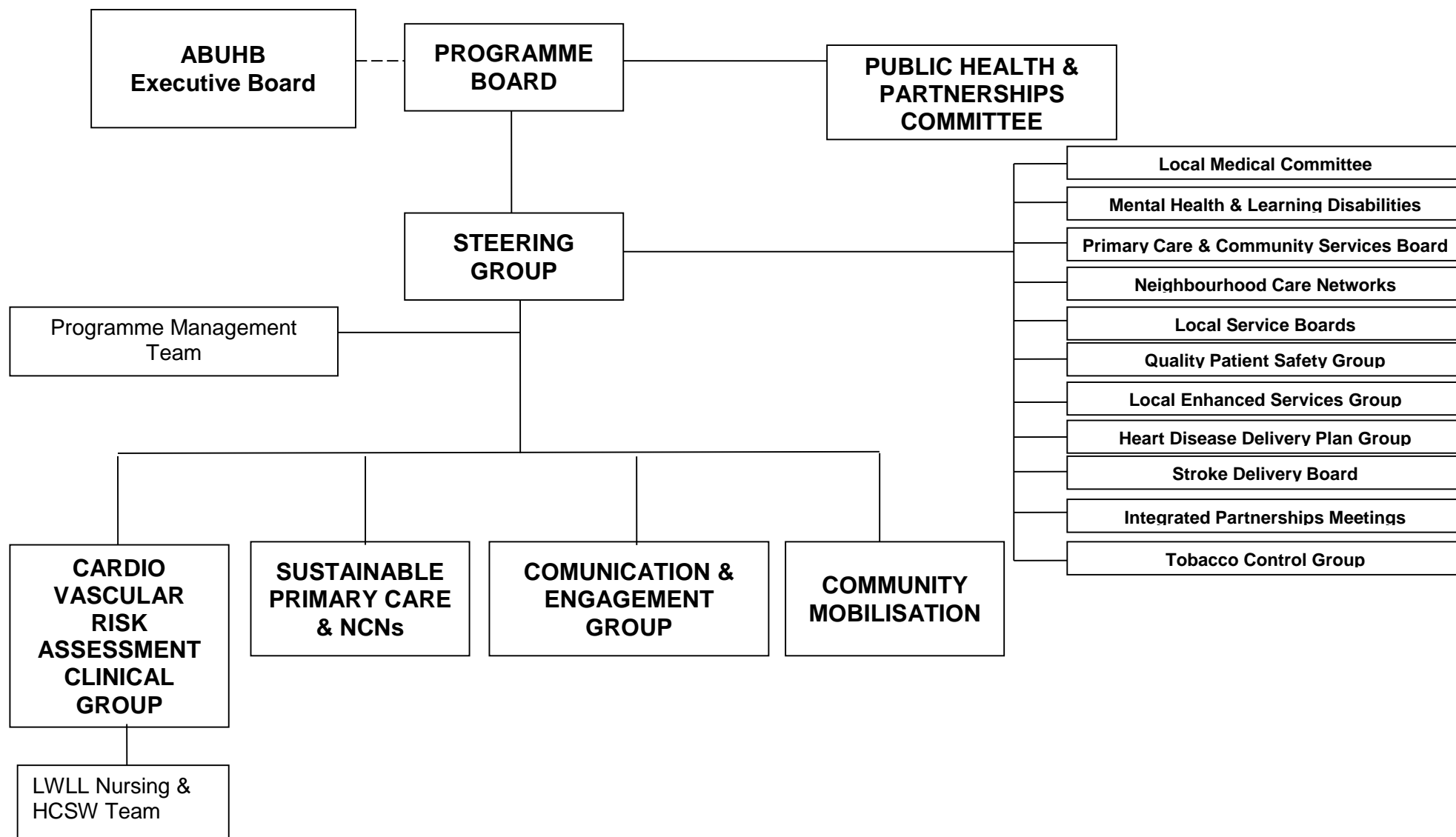
## 6.0 Structure and reporting





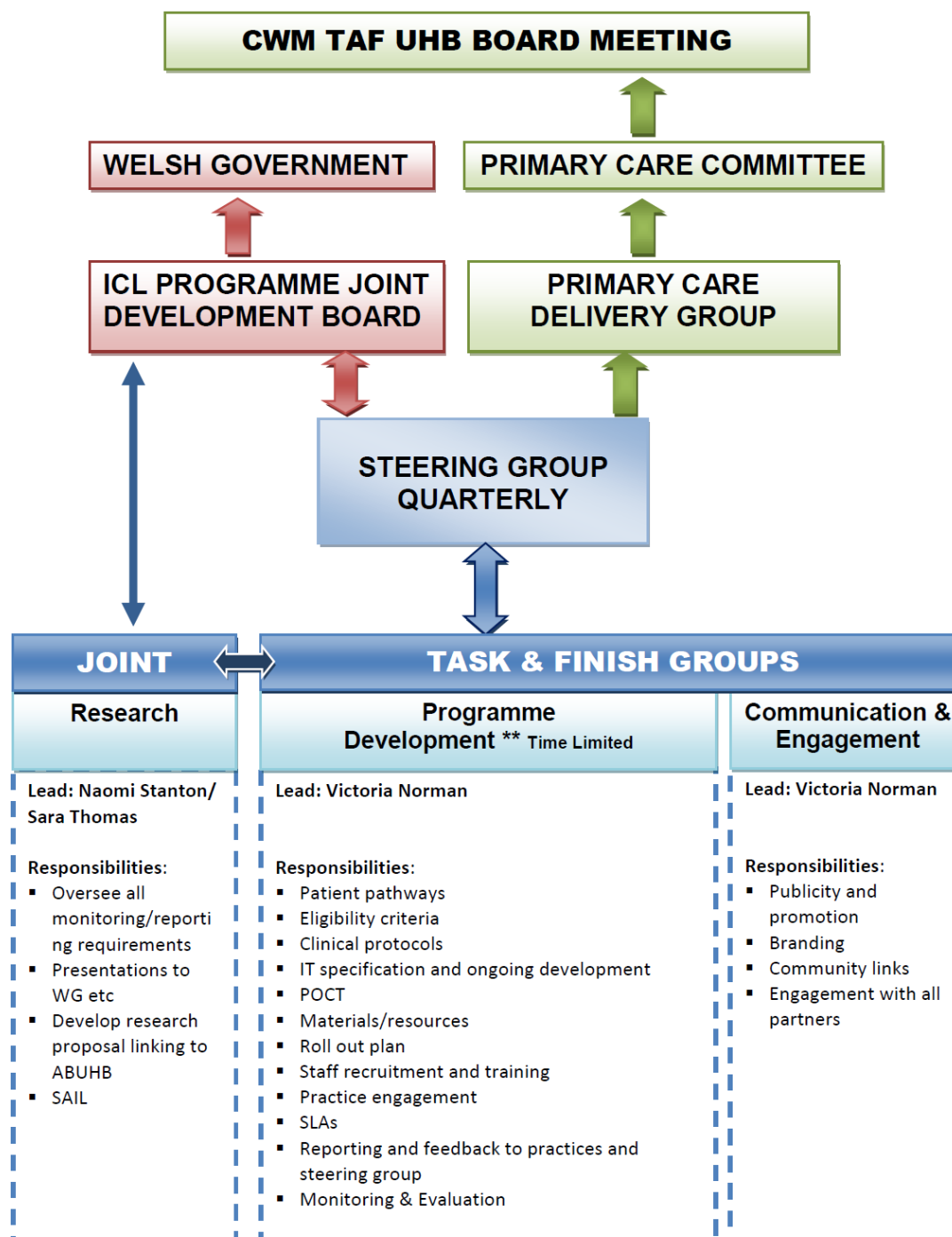
## Aneurin Bevan UHB Structure and Reporting

## Annex 1



## CARDIOVASCULAR RISK REDUCTION PROGRAMME

### Structure for programme development and reporting



## **Annex 3**

### **Key National ICL Programme Workstreams**

- **Cardiovascular Disease Risk Assessment Specification**
  - Agreed specifications for inclusion criteria and content of CVD risk assessment programmes
  - Point of Care Testing Guidance & Framework
  - Clinical protocols and Statement of Practice
  - Clinical and lifestyle behaviour referral triggers
  - Threshold for statins (NICE Guidance)
  - Citizen Pathways for behaviour change and lifestyle support
  - Job descriptions, person specifications and Key Skills Framework for Healthcare assistants delivering CDV risk assessments
  - Competency framework & Healthcare Support Worker Training plan and models of sustainable delivery and providers
  - Staffing and supervision modelling
  - Remuneration and support mechanisms for clinical GP follow up
- **Research & Evaluation**
  - IT / software specification
  - Central Reporting Facility - Agreement of metrics / indicators for dashboard
  - SAIL
  - Agree performance measures at GP Practice, Cluster, Health Board and National levels
- **Sustainability**
  - Agree parameters for frequency of re-testing
  - Identification of new 40-year olds
  - Develop a “failed to reach” population model (definition & ways of reaching)
  - Optimise interventions for those on CVD registers and related medications
- **Engagement**
  - Branding
  - Social marketing/ community engagement
  - Publicity

### Case Study 1: Paul Thomas



Walking Football was an inspiration for Paul Thomas after attending his CVRA at his GP surgery and found he was at risk of heart disease or diabetes.

Paul had put on a stone in weight after he retired from his job in public sector finance and admits he had started to feel 'sluggish' and was getting headaches. But he put the pain down to an old shoulder injury he had suffered in a fall.

The 65-year-old from Cefn Coed then received a letter from his GP surgery in Dowlais to attend a 'Health Check', which was followed up by a phone call. "I'm not really a person to go to the doctors, I have to be dragged there," he said. "And I don't like needles and that sort of thing."

The appointment revealed that his blood pressure was raised, he was classed as overweight and his cholesterol was also above the desired level.

The findings also showed that he had almost a one in five chance of developing a cardiovascular condition or diabetes in the next 10 years.

"I now realise the headaches were something to do with my blood pressure. But I felt fine and wouldn't have thought to go to the doctor," Paul said.

After recommended changes to his diet, and increased exercise, his statistics are all reduced, something he achieved without the need for medication.

"I followed the diet guidance and try to eat high fibre and low fat food. I cut cheese and pastry out of my diet completely. I cut the drink by 50% and became more active, taking the dog for longer walks and playing Walking Football at Penydarren Park, Merthyr Tydfil, every week.

“I didn’t want to have to take statins. I am pretty determined when I set my mind to something. I have achieved my goals by diet and exercise alone.”

The football sessions, held every Thursday morning on the club’s artificial pitch, are part of Merthyr Town FC’s community programme and supported by the FAW Trust and Active Merthyr.

## Case Study 2: Alan Easton



Lorry driver Alan Easton responded to a letter to go into his GP surgery in Merthyr Tydfil for a health check.

What he discovered was life-changing.

The 57-year-old was told he had Type 2 diabetes and his ‘heart age’ was equivalent to someone aged 83, putting him at risk of disease.

“What bothered me most was if anything happened to me, what would happen to my wife, Brenda? We have been together for 35 years,” he said.

He was referred to his GP for treatment and he listened to the advice from healthcare support worker Matthew Tovey about diet and lifestyle.

After the initial check with the team at the Keir Hardie Health Park in Merthyr Tydfil, the assistant transport manager left for two weeks holiday in Spain, where he decided not to touch a drop of alcohol after learning the results.

Alan also changed his diet, dropping bags of crisps and biscuits for more healthy salads and chicken and cutting back on salt.

He has shed more than two stones, reducing his weight from almost 19st to under 17st in two and a half months with the help of his wife Brenda.

His diabetes is now under control by medication and diet.

His blood pressure is within the normal range, having previously placed him in the 'high risk' category, with a more than one in three chance of a heart attack or stroke within 10 years, if changes were not made.

"I was eating just one main meal a day, possibly late at night with a couple of bars of chocolate at bedtime watching TV.

"I was getting really bad headaches and feeling aches and pains but put it down to getting older," said Alan.

"Now the headaches have gone and I feel so much better. I am eating regularly and more healthily, and we have a bike at work which I take for a ride for a bit of exercise.

"I would say to anyone who gets a letter to come in for a health check, just do it. I have been telling all the other drivers in work. If I had become ill, my livelihood could have been at stake."

Wife Brenda said: "There is so much good information available in the leaflets Alan was given but unfortunately many people ignore the good advice until it is too late."