Cardiovascular risk screening and management

– a targeted systematic population approach

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PART 1: 7000 risk assessments and audit of 2000 electronic decision support management applications – results and clinical implications

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ABSTRACT

Aim

The aim of the project is to reduce the burden of cardiovascular disease and diabetes in Waitakere City.

Method

Primary and secondary interventions to reduce cardiovascular risk were initiated to the Waitakere high needs population, utilising services to improve access (SIA) funding. Patients within this sub-group with high cardiovascular risk were identified by implementing the 2003 NZGG guideline[1] on assessment and management of cardiovascular risk. The electronic practice tool Predict™ was adapted as a web-based PHO tool independent of Practice Management Systems, allowing close monitoring of all HealthWEST practices. Patients in the SIA sub-group were identified in each practice and 'green flagged' in the Predict™ database. It was intended that the electronic management decision support module would record and support adherence to the guideline of treatment for patients over 15% absolute risk (of a CVD event in the next five years).

Results

Up to 13 November 2007 a total of 7080 patients had been screened, 4500 were green flagged (SIA) patients. There were 14.9% Maori and 26.8% Pacific peoples. High CVD risk (greater than 15% plus previous CVD event) was identified in 35%. Diabetic patients made up 22% of all screened and in this group 19% had an HbA1c greater than nine. There were 19% smokers in the all screened group, but 24% in the clinically high and very high risk group. There appeared to be no reduction in smoking rates in the identified high risk compared to all screened.

The electronic decision support module was applied to 2029 patients, but only 759 of these were in the high and very high risk, and 51% here had a BMI recorded as greater than 30. LDL levels were recorded where the EDSS was used; and in the high and very high risk group, 46% were greater than 2.5 mmol/L.

Conclusions

1. Although outputs are encouraging, it is too early to see outcomes indicating a reduction in cardiovascular events in the population. We hope to conduct a retrospective analysis of hospital admission data, outpatient attendances and mortality data, comparing those patients who were risk screened and managed to guideline, to those without prior risk analysis.
2. Analysis of electronic decision support system results so far show that less than one in five patients (diabetics and non-diabetic) were managed to guideline recommendations.

Keywords

Cardiovascular risk, screening, population health

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Project description – Guideline Implementation Project (GIP)

Cardiovascular disease and diabetes is a serious health problem in Waitakere City (population 180 000), where 37% of the total population are in Quintile 5 (NZ Deprivation 9 and 10). Near 50% of admissions for CVD events are first presentations and roughly half of these are fatal. New Zealand has at least three- to four-fold (ethnic, socioeconomic and geographic) differences in health risk, outcomes and access to care.[2] CVD is the leading cause of death in Maori.[3]

Research involving primary care patients has shown *'that more than two thirds of people with cardio-vascular disease were not receiving guideline-recommended medications and that there was little evidence of targeting by absolute risk for those without the disease.'*[4]

In December 2003 the NZGG guideline for risk screening and management of cardiovascular disease (CVD) and diabetes was released.[1]

HealthWEST PHO decided to implement the evidence-based NZGG guideline as a web-based project, in an attempt to reduce morbidity and mortality from CVD. The decision was to develop a fully electronic, systematic, targeted population-wide project with an initial sub-target group based around available funding (services to improve access or 'SIA'), that is, Maori, Pacific Islanders and patients in high deprivation areas (Quintile 5). Measurement and clinical audit of practices' performance was high priority, as was patient confidentiality and security of data. It was known that GPs often did not record cardiovascular risk assessments in clinical records. This was demonstrated later in 2005 by Rafter et al.[4]

The eligible population, determined by the guideline algorithm, is:

- all males over 45
- females over 55
- 10 years less if Maori, Pacific Islander or from Indian sub-continent.

Applying this formula to HealthWEST's enrolled population of 139 000 provided a screening subset of 40 – 44 000 people, of which approximately 10 – 12 000 are in the Services to Improve Access (SIA) subgroup (the actual number varies due to population movements). The risk assessment is expressed as a percentage absolute risk of having a cardiovascular event (myocardial infarction or stroke) in the next five years. Above 15% is considered high risk, a previous CVD event automatically registers the patient as very high risk. The risk assessment is based on many clinical factors including family history and recent blood tests (cholesterol, HDL ratio, glucose) and patient measurements (BP, BMI and/or abdominal waist). Practitioners mainly tick boxes on the screen and in the embedded form, practice data self-populates into the Predict™ screen.

A payment of $25 has been made for eligible SIA patients screened and $45 for management recorded in the EDSS for patients with >15% risk. Payment invoices are created electronically.

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All the patients who have been screened receive lifestyle advice at the practice; those with a CVD risk above 10% (and consenting), are expected to be referred to an exercise programme through the Green Prescription (GRx). Trained health promotion staff (Maori, Pacific and Caucasian) interview the patient and family and provide opportunities for many subsidised exercise activities. Those above 15%, who are receiving medical treatment to lower their cardiovascular risk, are referred to Green Prescription Plus, a more intensive programme. GRx uses a separate database, which allows matching of those with high risk with referrals received and measures compliance with the activities arranged.

The Predict™ tool adapted

The guideline implementation project was re-designed as a Primary Health Organisation (PHO) based project, available to 31 HealthWEST practices (practice numbers reduced to 28 in 2007). The tool Predict™ had been validated and shown not to increase inequalities, especially if: *'It is accompanied by a comprehensive implementation programme to ensure the entire target population is assessed.'*[3]

It was considered unethical to offer screening to only one group of patients (the MedTech practices, comprising one-third of HealthWEST's enrolled population). To offer all practices screening, HealthWEST developed a web-based approach independent of the PMS. This allowed a consistent electronic format for all practices enabling access to (only) their own patient's data via a password to the web database. This web approach also allowed the development of a mobile screening clinic, the Wellness Out West (WOW) Bus.

HealthWEST consulted extensively with the authors of Predict™ (Enigma Publishing) and the University (School of Population Health), before contracting Enigma to set up and manage the database, to provide reporting and to work with PMS vendors to embed the software in practice electronic medical records.

Project summary

Early 2004

Initiation of the project and development of training manuals, academic detailing, peer support and provider education.

Mid 2004

Web-based version of Predict™ piloted in some practices.

October 2004

The project taken to all practices, CVD nurse support initiated.

Early 2005

The systematic population screening began targeted to SIA patients.

April 2006

An outreach programme to improve access and inequalities commenced using an electronic 11m bus.

May 2006

Waitemata DHB approved the business case allocating $1.2m per year for four years for CVD screening across Waitakere, North Shore and Rodney districts.

June 2006

The electronic decision support, web-based became available.

Mid 2006

A nurse-led approach encouraged.

Late 2006

Three practices achieve 75% of their SIA target.

Early 2007

The embedded form of Predict™ with electronic decision support instituted in MedTech 32 practices.

Late 2007

Achieved risk assessment on one-third of SIA enrollees and screened a total of 7000 Waitakere eligible residents. Green prescription software integrated with Predict™. Group data reporting automated. Initial funding received from the DHB for coordination. Screening all 1400 patients registered with Waitakere Mental Health Services commenced, with an emphasis on metabolic syndrome.

Early 2008

Anticipated population funding from Waitemata DHB to screen 50% of the wider NZGG eligible population.

Results

A Screening for CVD risk

1. 7080 patients have been screened; these include 4554 (64.3%) green

Figure 1. HealthWEST All Patients Screened – Percentage Risk 13 November 2007

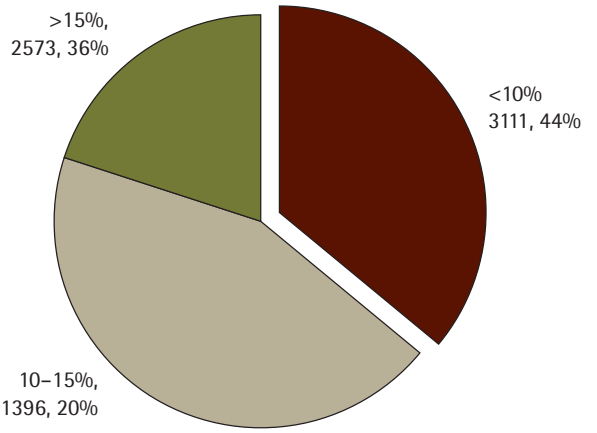


Figure 2. New Zealand Maori Percentage Risk – 13 November 2007

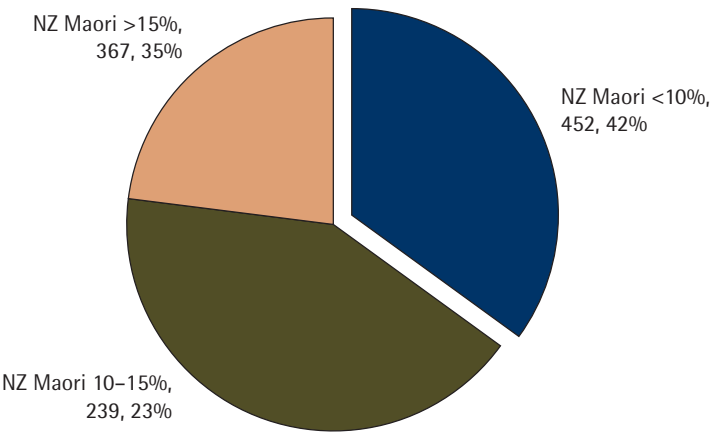
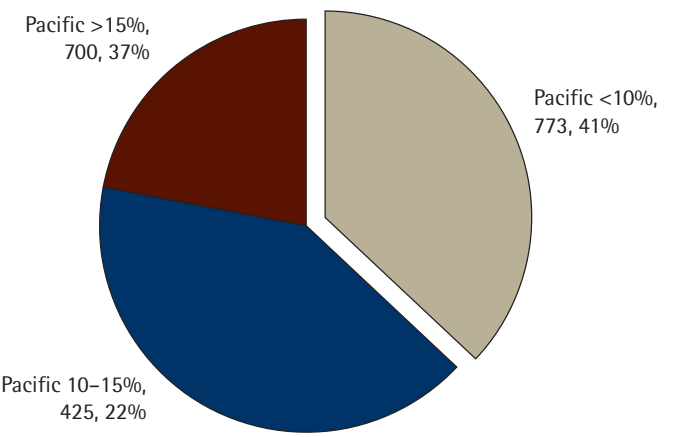


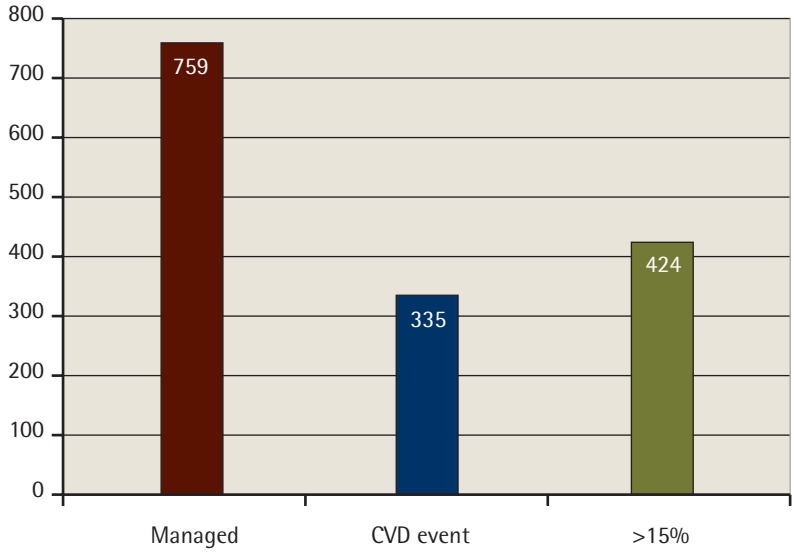
Figure 3. Pacific People Percentage Risk – 13 November 2007



flagged patients. Of the total screened, 1058 (14.9%) were Maori, 1898 (26.8%) Pacific Island, and 1147 (16.2%) geocoded as NZ deprivation Quintile 5 (non Maori, non Pacific).

2. A CVD risk greater than 15% risk was found in 2573 (35.7%); this included 1255 (17.7%) patients with a previous CVD event (recorded as clinically high risk).
3. The number of diabetics in all screened, was 1583 (1583/7080) or 22.5%, and 558 (35.2%) had a last recorded HbA1c of greater than 8%, 299 (18.8%) >9%. The mean HbA1c was 7.8 (n=1583).
4. Blood pressure: of all patients >15% risk, 21.3% (541/2529) had a blood pressure equal to or greater than 140/90 mm Hg.

Figure 4. Management of HealthWEST patients – 13 November 2007



B. Management with the electronic decision support system

1. The management module (electronic decision support system, or EDSS) was applied to 29.5% (759/2573) of the greater than 15% risk This group of very high risk and high risk patients where the EDSS was used, included 335 with a previous CVD event (44.2%) and 424 with >15% risk (55.8%).
2. Diabetes management: 41.3% (314/759) of diabetics in the high and very high risk group were managed with EDSS; of these diabetics 73.5% (231/314) were on anti-platelet drugs, 73.2% (230/314) on ACE 1 or 2, and 82.8% (260/314) on any anti-hypertensive therapy.
3. Smoking: of all screened, 19.3% (1360/7080) were current smokers and, of the high and very high risk (>15%), 23.9% (606/2529) were current, nearly one in four patients with high risk.
4. Metabolic syndrome was diagnosed in 28.7% of all high risk (727/2529) and in the EDSS group 84.4% (641/759) had a BMI >25, and 51.5% (391/759) had a BMI >30.
5. LDL levels in the high and very high risk showed that 45.7% patients (347/759) had a recorded level greater than 2.5mmol/L.

Overall, 36% of patients screened were in the high risk group (>15%), 44% in the low and 20% in the medium risk group. These results may be skewed as patients with a perceived high risk have been screened preferentially; it is anticipated that when 75% of the population has been screened the high risk numbers will be nearer 25–30%. The project manager reports on ethnicity, gender and age and, importantly, on progress by each practice. Medical Council and Nursing Council numbers identify the screening practitioner and the national health index (NHI) identifier allows tracking of individual patients.

Developing a programme for population CVD screening and management of high risk patients, to a population of 180 000 people, with many socioeconomically disadvantaged people…was a challenge. It still is.

Discussion

Developing a programme for population CVD screening, and management of high risk patients, to a population of 180 000 people, with many socioeconomically disadvantaged people (70% of all Waitemata high needs reside in Waitakere City), was a challenge. It still is.

From a clinical outcome point of view it is early days. At the time of writing, funding has just been made available to initiate screening on the non-SIA population. As of December 2007, nearly one-third of all screened are non-SIA. HealthWEST allocates some funding from the SIA budget, but any real expansion of the programme will be dependent on the new DHB funds being applied next year.

An important issue will be to target to the high risk; many of these vulnerable patients are still smoking, need lifestyle interventions as shown by their rates of metabolic syndrome or BMI (next year the measure may be, more simply, waist circumference). Over 20% have poorly controlled blood pressures (greater than 140/90).

Looking at the data from the EDSS, it is disappointing to find that only 10% of the high risk patients have their clinical management recorded. We anticipate this will increase as many practices only run the management module 12 months after identification of risk, and the EDSS has only been available for 16 months.

From the data so far, we can say that approximately 20–30% of patients in the high risk categories are not managed to guideline recommendations (LDL levels, BP, HbA1c). Conversely, 70–80% are managed to guideline! There may be many reasons for this; for example, patient (inappropriate) decisions, patients on lifestyle interventions pending pharmaceutical treatment, drug allergies and reactions, mistakes and poor recording and, finally, inappropriate prescribing.

It would seem that all patients of high and very high risk should be on maximal medical management, including lipid and blood pressure lowering drugs, aspirin and in diabetics, ACE inhibitors. It is clear that blood pressure should be treated aggressively; one does not have to look far in the literature to confirm this: *'It is important to address other risk factors in the hypertensive patient... and to treat even mildly elevated blood pressure...and most patients with significantly raised blood pressure should be warned that they almost certainly need a combination of two or three agents to gain effective control.'*[5]

Sinclair reports on 6570 patients screened and where complete management data was available on 736 (232 with previous CVD, 157 diabetics and 346 >15% risk). He states: *'The clinical performance indicator data for those patients with CVD and complete management data...demonstrates a treatment gap with 18% of patients still smoking, 26% not on aspirin, and 35% not on a statin. Only 9% received all the guideline recommended interventions for patients with established disease.'*[6]

Table 1. Summary of clinical data from the EDSS used in >15% CVD risk

	All risk assessed (%)	Assessment of high risk, >15% + previous event	EDSS/management of >15% risk
Totals	7080 (100)	2529 (35.7%)	759 (10.7)
Gender	3788 male (53.5)	1500 male (59.3)	
Mean age males	54.4 (n=3788)	61.9 (n= 1500)	
Mean age females	59.4 (n= 3291)	65.7 (n= 1029)	
Deprivation Quintile 5	2221 (31.4)		
Diabetes	1583 (22.5)		
HbA1c >9	299/1583 (18.8)		
Blood pressure >130/80	3845/7080 (54.3)		
Blood pressure >140/90		541 (21.3)	
Smoking	1360 (19.3)	606 (23.9)	
Metabolic syndrome	1592 (22.5)	727 (28.7)	
BMI >30			391 (51.5)
HDL <1.0			84 (3.5)
LDL >2.5			347 (45.7)
Aspirin or clopid			499 (65.7)
Statin or other LL			453 (59.7)
Beta blocker			254 (33.5)
ACE or AT2			429 (56.5)
Antihypertensive			558 (73.5)

Our statistics included the over 15% risk as well as previous event and, although it is too early to be sure, it may indicate that the Predict™ management module encourages more complete compliance with the guideline.

In part two we will look at some of the barriers and enablers to implementation of the CVD guideline, the role of the practice nurse and how a PHO can influence and manage the dissemination and implementation across a geographical district.

Competing interests

None declared.

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