



Evaluation of Gardens4Health

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Executive Summary

Gardening to produce vegetables and fruit is a legitimate tool to help improve the health of a population, and the 'community gardening' approach can bring gardening back into the reach of people who may not be resourced, have the appropriate knowledge, wherewithal or facilities to garden at home. Research suggests that gardening is potentially an effective instrument which can be used to increase consumption of fruit and vegetables and increase physical activity, both potent tools against obesity and related disorders such as diabetes, cardiovascular disease, and some forms of cancer. Other literature describes the community gardening approach as likely to achieve multiple health benefits in a relatively efficient manner, as well as having social, financial, and environmental gains.

The Gardens4Health approach of supporting others to take responsibility themselves, has seen an exponential increase in the number of gardens across Auckland, and the team provides continuing input into these gardens as needed to ensure their sustainability. That demand seems set to continue as more are encouraged and supported to fund, set-up and run their community gardens.

Data was gathered to answer ten evaluation questions. Questions around the garden participants themselves showed that they came from a range of backgrounds. Actual 'gardening skills' themselves were not necessarily the primary characteristic as considerable time and effort was spent in other activities such as administration, teaching, and coordinating. This makes what might seem to be the relatively uncomplicated activity of 'planting and growing' actually knowledge and labour intensive, with extensive commitment and time also required from participants.

Questions looking at health related changes for participants showed improvements in a range of areas including self reported greater consumption of fruit and vegetables, higher levels of physical activity, feelings of wellbeing and being more comfortable with where their food actually comes from.

The majority of respondents when asked questions around community and environmental aspects felt that they had received 'some' or 'great' benefit from their involvement in Community Gardening as supported by Gardens4Health.

Questions looking at the knowledge and skill changes again showed improvements, with the majority of responses in the 'big' or 'some' help category. Some individuals retained their own way of doing things for some aspects (for example organic versus non-organic practices), however in the main there was perceived benefit across a range of knowledge areas.

The transfer of community garden involvement to increased home gardening was looked at, and over half of the respondents had started, restarted, or wanted to start a home garden.

Open questions looked at the things participants found most enjoyable or useful from their involvement with Gardens4Health in relation to community gardening. Several distinct themes were identified, including 'bringing people together/company/working together', 'skills to start, develop and maintain a garden', and 'support knowledge and practical help'.



The open question around what could be done better by Gardens4Health received the most prevalent response of 'nothing', but there were less common themes of change to the structure of stakeholder meetings/teaching ('more' or 'less'), the desire for more focus on home gardening, and there was support for gaining increased funding and making improvements to communication.

The final question relating to what barriers respondents perceived as being a problem for people who might want to participate in community gardens highlighted the themes of self-perceived lack of skills, time, funding, transport, drive/desire, cultural/social considerations, and personal characteristics.

Gardens4Health would appear to be delivering a valued service which is felt to be beneficial at a range of levels by those participating. The programme has broad reach across Auckland and is able to facilitate the networking of gardens and sharing of information, as well as contribute to the wider picture through presenting what has been learned at public venues, submitting to local body planning, and keeping in touch with District Health Boards. Recommendations for the future include looking in more detail at key areas of interest raised from this evaluation such as sourcing longer term funding to keep the programme viable and maximize efficiencies. Investigation into where changes can be made to such areas as transport, supplier network, leadership pathways, and better linkage with providers who can teach about what to do with produce are also of potential value.

Introduction

An evaluation was commissioned in 2011 as part of the routine contract for service delivery for the Gardens4Health programme. The objective of this evaluation was gaining a greater understanding around what does and doesn't work in relation to delivery of the community gardening programme Gardens4Health. Also required was the examination of evidence around community gardens in general as a way of impacting on the health of at risk community members. The direction was for a mixed methods evaluation to include process and impact, describe the activity itself, its effect and effectiveness.

Gardens4Health delivers activities to help groups set up community based gardens using sustainable best practice, it also provides support for maintenance and extension of existing gardens. This evaluation is expected to look at what works and what improvements can be made to the service.

There are multiple perspectives for looking at Community gardening, including coming from the direction of food security, protection of cultural practices, environmental considerations and health itself. These aspects are inextricably intertwined; however this document will focus on the health related aspects of community gardening.

Likewise published literature covers a range of perspectives, and a review of the relevant literature for this evaluation looks at three areas, community gardening in general, community gardening and health, health benefits for school and early childhood gardens, and success factors.



Community Gardening Literature

Community Gardening General

The definition of 'community garden' can be varied dependent on context, some definitions are comprehensive such as that in the Auckland Council Community Gardening Policy (2011) which describes a community garden as

“A small scale low-investment neighbourhood communal gardening venture, growing vegetables, fruit and/or flowers. It uses vacant or unspecified open space – either in the public domain, or owned by another organisation or business (for example by a church or through a public housing body). Community gardens may have an explicit gardening philosophy such as organic growing, permaculture or biodynamic gardening, or they may allow participants with individual plots to manage them as they see fit. They may also establish nurseries to propagate and raise seedlings for their gardeners”.

A less comprehensive definition may be that:

“A community garden is a plot used by the members of a community to grow things for the community”.

The growing popularity of community gardens is a relatively recent phenomenon in New Zealand. Most reports suggest that home gardening was once the preferred option given the historical tendency for New Zealander houses to be sited on larger sections, which is unlike other countries, for example in the UK, Canada and the US, where higher density housing made community or allotment gardens more common. In recent times anecdotal reports are that home gardening has declined in New Zealand, subsequently many individuals, particularly children, haven't been exposed to the growing of food in the domestic setting. It is consequently less common to find households with the skills or confidence to create their own food garden, but also there are reports of a growing lack of understanding by consumers of where food even comes from (Vilesis, 2008).

Community garden numbers however are increasing, though exact numbers are unclear. The Te Ara Encyclopaedia of New Zealand stated in 2007 that there were 20 community gardens in New Zealand, there are considerably more than this currently in the south of Auckland alone. Online lists seem to be quickly outdated, which is understandable, the Gardens4Health experience has been that there is growing demand for support to set-up new gardens.

Community Gardening and Health

In the Health sector, gardening is viewed as a novel approach to improving health at a community level. Gardening has tended to be acknowledged as having physical activity and nutrition benefits however has until relatively recently been positioned outside the traditional arena of health and health promotion related interventions. As an intervention there are practical issues of scale if home gardening is the focus, however community gardening gets around these practical issues by allowing concentration of intervention. Community gardens are also postulated as a way of encouraging the development of home based gardens as knowledge and skills increase.



Health related literature around community gardening as an initiative to improve health is sparse, however is becoming more common. As recently as 2005, Maskill and Hodges did an extensive literature review around intersectoral initiatives in New Zealand relating to health and gardening barely rated a mention. Clinton et al (2009) when looking at literature for the review of the CMDHB 'Gardening for Health and Sustainability' project also appeared to find very little local or overseas information to draw on.

In more recent times community gardening has been recommended as an intervention. The 2007 Enquiry into obesity recommended establishing vegetable gardens as one of the interventions to help schools deal with rising obesity (Kedgley et al). Bowers et al (2009) recommended in the ENHANCE document that community gardening had potential as a way of helping to ensure food security and generating increased physical activity for Maori, Pacific and people with low incomes. There has since been examples of active support at District Health Board level across the country, as well as some efforts from MOH and other Government Agencies.

An unpublished thesis by Margaret Earle (2011) looked at Auckland and Wellington community gardens. While she also highlighted lack of information on the impact of gardening on nutrition and physical activity and recommended further research into this area, her research in existing gardens identified multiple health related benefits reported by participants. These benefits included fruit/vegetable consumption, access to foods which are more culturally appropriate, knowledge, physical activity, social, connection with nature, and mental stimulation. She also identified more community orientated benefits including local supply of healthy food, community knowledge, focus of physical activity and interaction, and having a pleasant space.

Looking overseas there are examples where gardening has been seen to have a positive effect on the health of particular groups, for example improvements were reported in relation to social, physical and emotional health of elderly participants in community gardening in New York (Austin et al, 2006). Twiss et al (2003) reported positive health benefits in California through community garden initiatives, including self reported information from over 300 survey participants who described increased physical activity, and consumption of fruit and vegetables. Alaimo et al (2008) examined fruit and vegetable consumption in Michigan and found that where a household member participated in a community garden adults were much more likely to consume fruit and vegetables, and in higher quantities on a daily basis.

Physical activity is considered an area where gardening can make an impact, however, how much impact is reasonable is another question. The SPARC (2009) Active New Zealand survey of 4443 adults was extrapolated to the New Zealand population and came out with gardening being described as being second only to walking as the sport/recreation activity of choice (43%). The concern around this information is that the figures do need to be viewed carefully when drawing conclusions about potential gardening impact, the criteria for inclusion was that the individual participated at least *once* in gardening in a 12 month period.

There are also other postulated, health related benefits apart from better nutrition and increased physical activity, Groenwegen et al (2006) took the approach that having 'green spaces' better used at community level has benefits for all, even those who don't participate, proposing that there was a 'vitamin g' effect on health from having green spaces available to the community.

Our own findings from the survey described in the following pages are that multiple aspects of health related behaviours improved in the community gardening context, with self

described nutrition, physical activity behaviours improving, and other factors such as how the individual feels about where their food comes from, and greater enjoyment of life and feeling of health generally. Social aspects, feelings of safety, and caring about the environment also improved for most, and all of these changes weren't restricted purely to those who did the actual gardening.

Health benefits for School and Early Childhood gardens

Not all gardens which provide food for a group can be defined as 'community', as in the case of some school gardens where food is grown for the 'school community', and individuals from outside the school itself may not be able to participate and access the gardens. Some do take more of a community approach, and even where benefits are confined to the 'school community', there is material emerging describing positive results from these gardens which is worth noting. Health Outcomes International (2011) described establishment of campus gardens in the South Island District Health Board areas, reporting that their findings reinforced the findings of other literature around health benefits of gardening for school children. These benefits included greater physical activity, learning motivation for students, psychosocial development, co-ordination benefits, cooperation with peers and generating a sense of pride in, and ownership of the education setting, all of which factors have associations with improved health and educational outcomes.

Another school related intervention was described by CDHB (2011) reporting on 5 years of the WAVE project which aimed to "create and support healthy environments for the children and young people of South Canterbury". This evaluation describes resulting improvements in a range of health related areas, however establishment of gardens would appear to have been a relatively small part of this project. As it isn't clear how prevalent gardening was in relation to the other project initiatives, it is difficult to evaluate it's impact, and there isn't evidence or even conjecture in the reporting document that gardens themselves were significant.

Success Factors for Community Gardening

There is some evidence around what are the key elements for success of community gardens. A survey in California concluded that the most important aspects were commitment of local leadership and staffing, diverse volunteers and community partners, and skill building opportunities (Twiss et al, 2003). In Wellington, NZ, Scanlan et al (2007) described factors leading to successful outcomes in their gardening experience, including fertility of the location chosen, pest deterrence, provision of professional gardening help and language suitable workshops. Thomas (2008) describes important factors for community garden success in Sydney, Australia, including having an established garden group, researching, setting aims and objectives, planning, a good site, and administrative factors such as funding, insurance, health and safety and maintenance.

While not directly targeted at community gardening, Maskill and Hodges (2005) in their review of New Zealand intersectoral initiatives came up with another list, including, support in the wider community, capacity to carry out action, relationships defined/developed, actions planned/implemented and outcomes monitored.

Contracting reports from the Gardens4Health programme to involved District Health Boards describe observed key factors for success, including the vital support of an extensive

stakeholder group, relationships with various agencies including Council, adequate expertise available, adequate funding, ongoing support at the level needed.

One consideration unique to gardening is the understanding of the importance of the seasonal nature of gardening. Certain activities are possible at certain times of the year, and some times are inappropriate for certain garden activities to be carried out which may not fit in with funder requirements, particularly where short-term funding exists. Batten and Holdaway (2010) describe the conflict between timelines being essential to support planning and promote the achievement of milestones, however they can force prioritization in a way which isn't always best for health promotion activities.

About Gardens4Health

History of Gardens4Health

In 2008 a community gardening pilot called 'Gardening for Health & Sustainability' was run in the Counties Manukau District Health Board (CMDHB) area as part of their innovative 'Lets Beat Diabetes' (LBD) programme. The key points included community gardening promoting increased physical activity, improving nutrition, being socially and culturally important, and making economic and environmental sense. The pilot involved facilitating and supporting the creation of community garden plots with the eventual expectation that these would translate into the development of gardens in the home setting.

The original model from CMDHB LBD planning document was described in the following diagram (Martin, 2008).



There was also the intention stated in this planning document that by 2012, the Initiative aims were to have trained 2000 households to create and maintain food gardens in the home setting, and 60 linked community (school or Marae or public) food gardens. This

prediction was based on the successful obtaining of a much larger amount of funding which did not eventuate.

At the end of 2009, the community organisation, Diabetes Projects Trust, took on the management of 'Gardening for Health & Sustainability' and redesigned the programme to become 'Gardens4Health'. At this point there were 12 community gardens involved in the Counties Manukau Area only. Funding sources from the MOH, and the two other DHB's (Waitemata and Auckland) allowed the extension of the programme across the wider Auckland isthmus.

The redesign occurred using as a base an evaluation document by Clinton et al (2009), the issues they identified from their stakeholder interviews included clarifying the nature of the intervention with stakeholders, improving communication, developing support methods, working on networks, improving meetings, looking at the role of schools/Early Childhood Education (ECE), and further monitoring. This evaluation had limited use for determining whether the programme was successful or not as it was carried out early in the process of establishing the programme, however it did identify improvements, and served to facilitate the change of process to a more community based model.

Other changes helped ensure that service design was such that the programme was more likely to be sustainable. This involved reducing the planned scale of the project, and taking a more hands-off support approach, for example, rather than providing funding from Gardens4Health directly to gardens, advice and guidance was given to allow groups to source funding themselves. Two part-time facilitators based in appropriate geographical localities were taken on to support the full time Project Manager.

Today's Gardens4Health service

As at December 2011 there are 43 community gardens with Gardens4Health involvement across the whole of Auckland, covering the Waitemata, Auckland and Counties Manukau District Health Board areas. There are also 9 gardening related activities which are not technically described as 'community', rather referred to as 'food initiatives', for example school gardens where there isn't active outside community involvement, or specialty sites such as seedling raising facilities. It needs to be clear that Gardens4Health doesn't own, or run gardens, it assists others to set up their own gardens and supports them to run them in a sustainable manner. The degree of support and input needed from garden to garden varies considerably, and changes over time as the needs of the community garden changes.

Area	Number Community Garden	Number Food initiatives
South/East Auckland – CMDHB	31	6
West/North Auckland – WDHB	4	1
Central Auckland – ADHB	9	1
Across entire region		1



The service at the time of writing delivers:

- Startup Advice
- Support to garden mentors and community co-ordinators
- Site check and planning help
- Finding application advice
- Budget reality check
- Sustainability best practice
- Information by phone on gardening matters
- Workshops on key topics
- Access to a supplier network
- Links to other gardens
- Resources and web-based information

Gardens4Health facilitators are geographically based, with one covering the Waitemata/Auckland area, and one covering the Southern/Eastern aspects of Auckland. Co-ordination and support is carried out by the Gardens4Health Project Manager. Other members of the Diabetes Projects Trust team are called in as needed, for example, the Medical Advisor can provide support to validate the idea that gardening can have a strong relationship with health, the co-ordinators of the DPT Healthy Workplaces and Schools programmes help on sites relevant to their areas of expertise, and Cook'nKiwi can provide some limited support regarding what happens to the produce after it is grown.

One of the key aspects is the 'Multi-Agency Partner Group' who meet 5 x per year, each time on a different garden site, alternating around the various areas of Auckland. Currently the group numbers 85 regular members from a very wide range of backgrounds. Meetings are described as 'gatherings' and involve some sort of information sharing with a round-up of member activities, and usually a presentation of interest. There are occasional field trips organised to visit member gardens to allow interested parties opportunities for networking and sharing of information. This stakeholder group has been identified by participants as one of the key success factors in the Gardens4Health programme.

Gardens4Health Vision and Aims

Gardens4Health Vision

"Grow a healthy, skilful, prosperous and sustainable Auckland through gardening."

Gardens4Health Aims

Key aims:

- To improve health and wellbeing and to reduce the burden of disease through better nutrition including fresh food consumption and regular physical activity.
- To expand knowledge in families and communities about how to start growing and maintain a vegetable garden i.e. teach food gardening skills, and facilitate access to healthy eating and nutrition education to help families identify nutritious fruit and vegetables, and encourage healthy eating habits and a healthy diet.



- To increase the number of communities and families in the region who have food gardens.
- To strengthen communities through shared food or communal gardening.
- Promote and adopt environmental and sustainable principles
- Transfer over-time the community gardening ethos and skills to home gardening practice

Other aims of the programme would be expected to be:

- Increase the uptake of fruit and vegetable gardening as a family recreational activity
- Greater access to fruit and vegetables
- Physical activity benefits
- Self sufficiency skill development
- Improved family relationships
- Cross generational support, learning and interaction
- Savings in household food budgets
- Environmental awareness
- Improve School-community relationships
- Wellbeing and belonging

Context of Gardens4Health

With the changes to the Auckland Council structures in the last 2 years, there have been implications for Gardens4Health. Initially it had the potential to liaise with up to 8 different Councils making up the Auckland region, some of which had more advanced structures and a more proactive approach to gardening. Currently a number of gardens are on Council owned land, there are negotiations underway for further use of council property, and there are several community teaching gardens which at the time of writing are facilitated and funded by Auckland Council (Manukau area only).

The 2010 Auckland Council has adopted the original Auckland central city Council community gardens policy which is a relatively dated document. It specifies that they see themselves “more as enabler and supporter of community garden initiatives, (rather) than a provider or funding source” (Auckland Council, 2002). Gardens4Health team members as well as other interested organisations and groups are currently contributing to the re-development of this policy document, which is expected to be completed some time in 2012. Gardens4Health as part of the Multi-agency Partner group put in written and oral submissions to the greater Auckland plan with the support of Colin Dale in 2011 as well.

Gardens4Health also sees itself as having a role in monitoring other policy development, including for example the changes to food policy which would potentially have had impact on the sharing of garden produce if it went through in its original form.

Three District Health Board areas are described in this document, Waitemata which covers North and West Auckland areas, Counties Manukau covering South and East Auckland, and Central covering the inner Auckland city area.

Evaluation Design

Methodology

Consideration needed to be given to the nature of the data to be collected, and also the reality of the relatively short timeframe. A purely quantitative approach would not have been appropriate when much of the community gardening success or failure is about the experience, however a mixed method approach looking particularly at the perception of individual participants, plus reviewing observed and process related information was decided as being appropriate to evaluate the Gardens4Health programme.

The following data collection methods were used:

- 1) Survey of partners and participants – a 14 question survey was developed using Survey monkey online service, including demographic data, questions around lifestyle/eating/health, how Gardens4Health has impacted on gardening generally for the person, and specific service detail. This survey was trialled and then submitted to the Gardens4Health stakeholders and participants. A snowball approach was considered if responses had not been adequate however was not needed due to early reaching of saturation point in the qualitative data.
- 2) Interview of stakeholders – 10 individuals who work in community gardens were interviewed using an interview schedule with crossover questions to the above online survey, and more detailed questions around the experience/perception of participants. This purposive sample was selected to ensure that some viewpoints which were not reflected in the online survey were captured, this included those from particular ethnic demographics, and those without computer access.
- 3) Documentation was collected and analysed around Gardens4Health generally, including service delivery.

Questions to be answered:

1. Who are the people involved in Community Gardening?
2. What roles are important to Community Gardening?
3. How much time is commonly spent in Garden related activities?
4. What impact has Gardens4Health involvement had on the health of participants in Community Gardening?
5. What impact has Gardens4Health involvement had on the Community/environment aspect of participants lives?
6. What impact has Gardens4Health involvement had on garden related knowledge and practice?
7. How has Gardens4health impacted on home gardening uptake?
8. What do Community Garden participants find enjoyable or useful about Gardens4Health input?
9. What can be done better by Gardens4Health?
10. What do participants in Community Gardens see as barriers to people taking up community gardening?

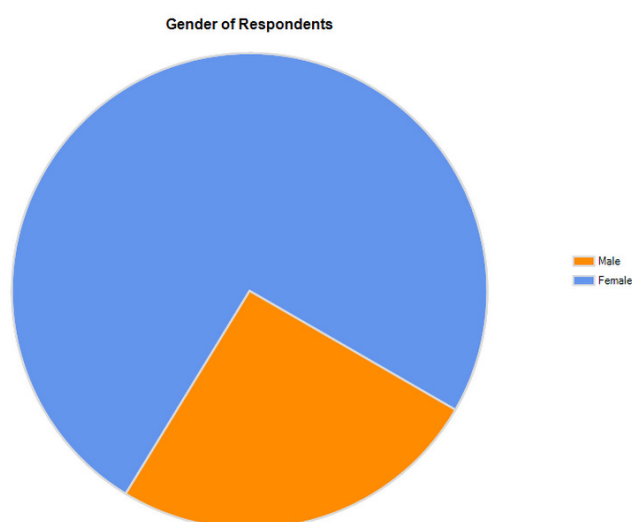
Evaluation Results

Evaluation Question 1 - Who are the people involved in Community Gardening?

Survey/Interview participant Numbers

Responses to the survey were excellent with the viewpoints of a total of 62 individuals being collected using two methods, 1) an online survey and 2) telephone interviews. 52 of the 87 (60%) who received survey links responded to the online survey and 10 of the 10 individuals selected to be interviewed participated. Responses were enthusiastic and 90% of online returns arrived promptly within the first 2 days of the survey link being open.

Gender of Evaluation Participants



Around three quarters of respondents to the survey were female. This is relatively similar to the findings of the 2009 Sparc report into Gardening as a physical activity which found around 65% of those participating in gardening were female. Observations made by the Gardens4Health team of participants in gardens back this finding up, however there may be differences between the different gardens, particularly in some cultural groups.

Ethnicity of people involved in Community Gardening

There are two sources of information around the ethnicity of people involved in gardening.

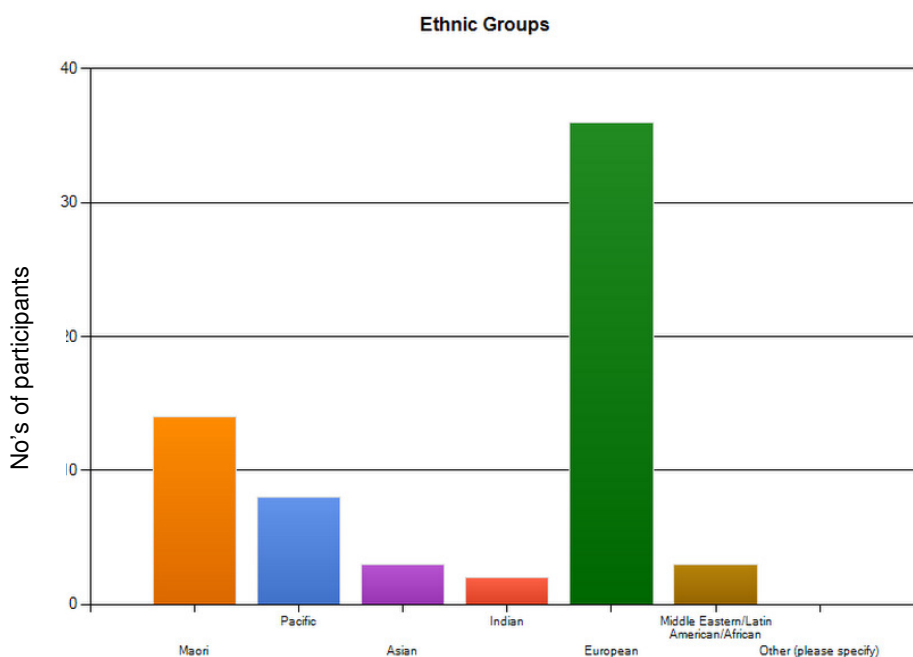
Gardens4Health Participation Total

Conservative records kept by the Gardening team suggest that the current percentages obviously participating in Community Gardening activities from different ethnic groups are: the following:

<i>Group</i>	<i>Number participants</i>	<i>% Gardens total</i>
Maori	651	31%
Pacific	1092	52%
Other	273	13%

Self Reported Ethnicity from Survey Participants

Combined self reported ethnicity data from the Online Survey and the Interviews gives the following numbers:



Compared with the estimated ethnic makeup of the groups actually involved in community gardens which Gardens4Health has involvement in, there is a mismatch between ethnic group of participants whose viewpoints are represented in the evaluation, and those actually participating in the gardens themselves. For Maori, 22% of Evaluation participants identified themselves as Maori as opposed to estimated 31% actual garden participants. For Pacific peoples only 13% of evaluation participants identified themselves as Pacific as compared to an estimated 52% of gardens participants, and Other made up the largest group in the evaluation at around 65% as opposed to 13% actual.

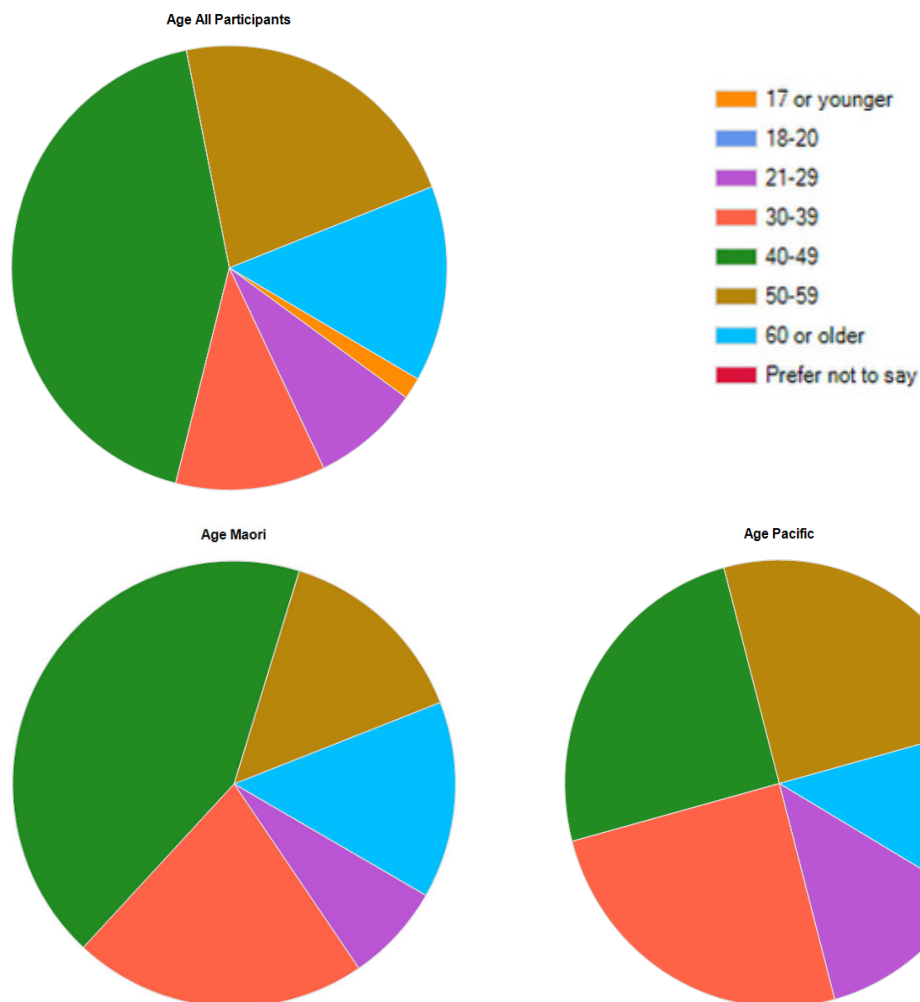
The ethnicity of respondents in the survey when compared with general population levels in the Auckland region according to the 2006 Census shows rather weighting in Maori (22% versus 11%), and Pacific (13% versus 14%), European (56% versus 56%) and Other also in proportions relatively consistent with census.

Viewpoints from various groups were canvassed however although obviously not in a manner representative of the actual makeup of community gardens participant. There may be a number of reasons for this, one is the choice of the internet survey tool which may exclude some in lower socio-economic groups, and another is the prevalence of older people working in gardens who may be less likely to access email/internet. Census data from 2006 showed that only 40% of people over 65 accessed the internet in one year as compared to younger age groups who had rates of access 65-85% (Statistics NZ, 2007).

It is felt however that there has been a wide range of useful information collected, and the considerable repetition of responses particularly in the 'open' questions suggests that the 'saturation' point normally experienced in qualitative data collection has likely to have been reached.

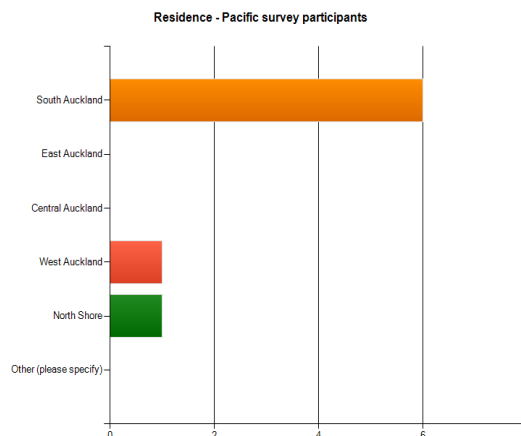
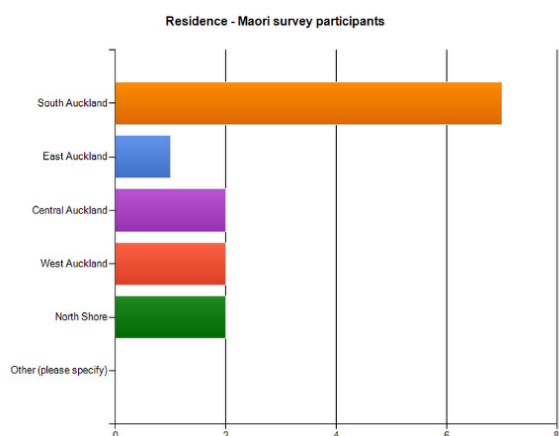
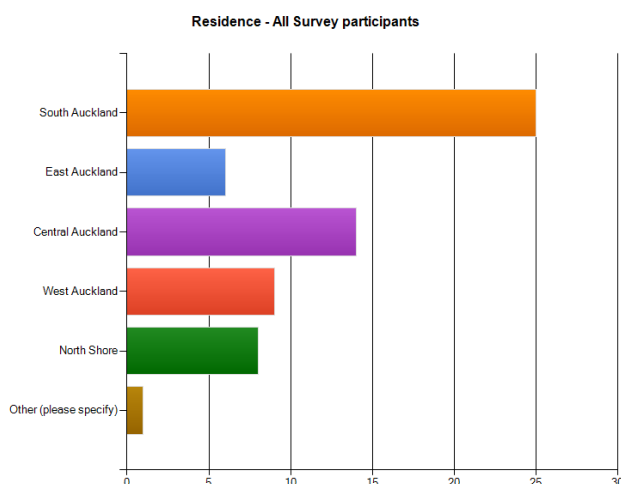
Age of Community Gardening Respondents

Self reported age from the Online Survey shows the following breakdown. It is interesting that the usual perception is that retired people are the main gardeners, the largest group in this survey was in the 40-49 age group, and while the next most common age groups were older, it was pleasing to see younger groups also strongly represented. Greater numbers of younger people were from Maori or Pacific heritage. Again caution needs to be used in interpreting these results due to data collection methods, see previous section.



Place of Residence of Community Gardening Respondents

Looking at the geographical location of those participating in the survey proved to be complicated. Some worked in gardens outside the area they lived in, some worked in or supported multiple gardens and where DHB areas are used some people are not always clear on these boundaries as opposed to previously used council boundaries (eg, some parts of Otahuhu identifying with 'South'). 47.5% of those surveyed or interviewed recorded their home domicile as being within the CMDHB area, 23.7% in the ADHB area, and 27.2% in the WDHB area. One respondent was from Waikato.



This variation between service delivery in different areas reflects partly the differing proportions of additional funding received from the different DHB's and also what they prioritised (eg, funding for workshops rather than gardens themselves). In the case of the CMDHB area, this is where the original pilot was carried out so more gardens were established in this area.

Evaluation Question 2 – What Roles are important in Community Gardening?

Gardening isn't just about the people who handle the soil, and particularly with a programme like Gardens4Health, the goodwill and input of people from a wide range of backgrounds is essential.

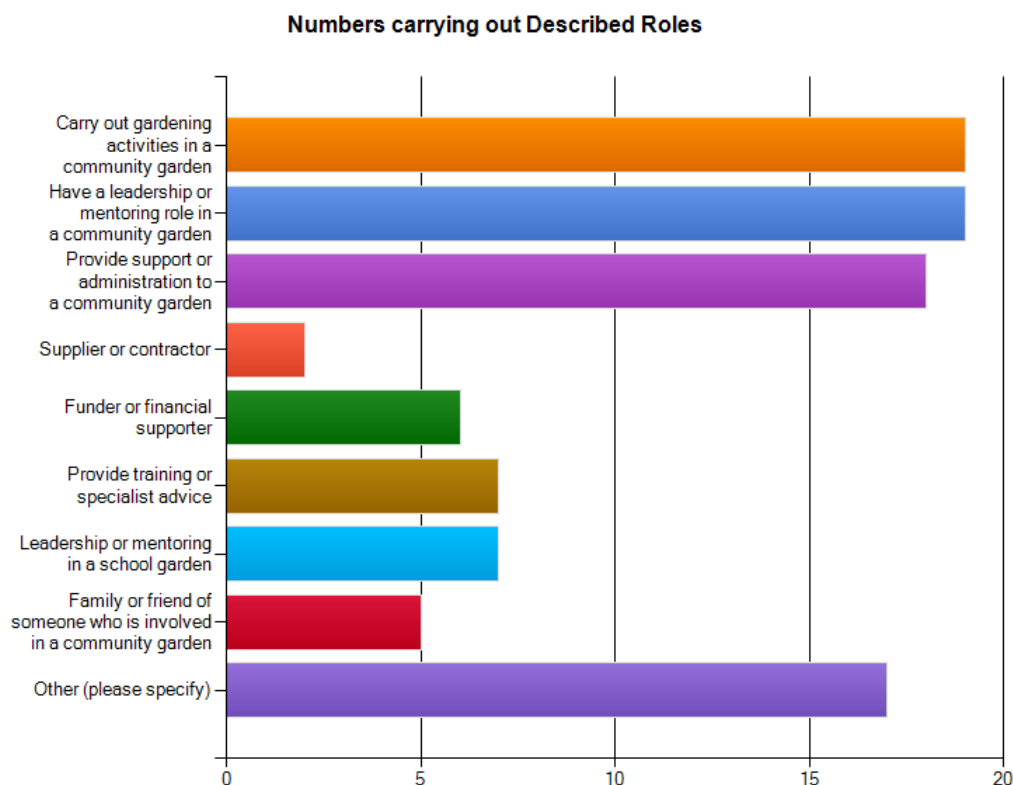
Leadership in particular can be undervalued in its importance in ensuring successful , sustainable community gardens, Burtsher (2010) noted that garden leaders have multiple responsibilities within their leadership role including dealing with issues of ownership, providing values and visions and direction towards achieving them, establishing and maintaining communication, rewarding, and ensuring transparency and inclusiveness.



It is apparent from the graph below that while a proportion (30%) of those responding to the evaluation survey were gardeners themselves, there was a spread of stakeholders ranging from funders, suppliers through to families of participants.

Respondents were asked to select all roles that applied to them, 27% had more than one role within the gardens. 8 people (13%) identified that they had more than 2 of the described roles. This implies the need for not just having gardening skills, considerably more needed in terms of participant skill-mix for a community garden to be successful.

The 'other' category was made up of individuals who were from varied roles with an interest in community gardening, but removed from actual input/activity associated with gardens.

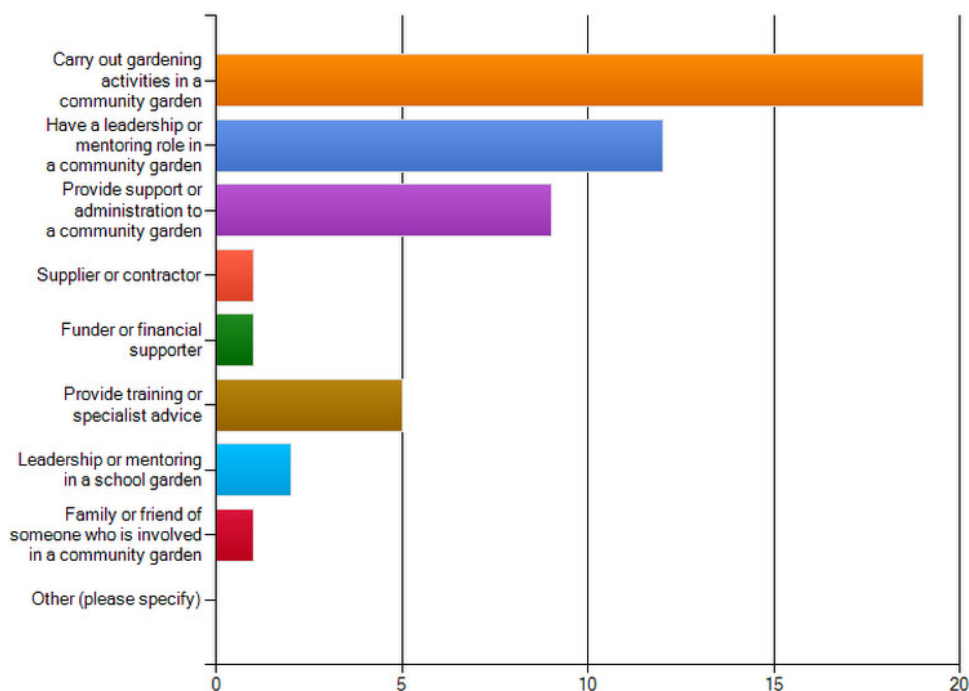


Active Gardeners

Looking at more detail at the 19 respondents who described themselves as 'carrying out gardening activities in a community (or school community) garden', 73% also had a leadership or mentoring role. 47% provided administration, and 26% provided training to others.

The multitude of skills needed across the spectrum from hands-on gardening to administration shows that setting up and running a community garden requires considerable effort and could do with further investigation. There are also a variety of other roles which are not normally thought of as being essential stakeholders in community gardening projects however are actually integral to their success and are worth further consideration.

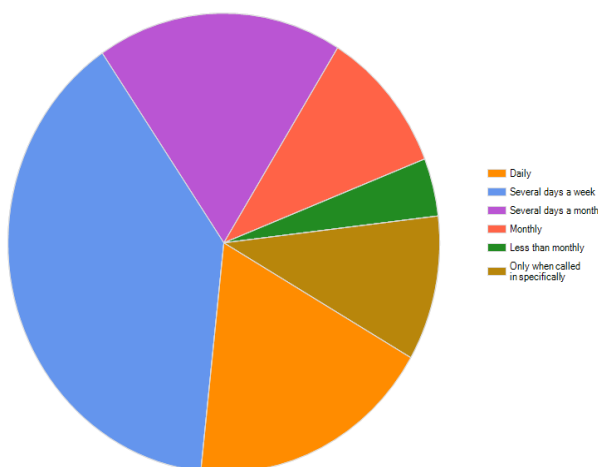
Gardeners carrying out other roles



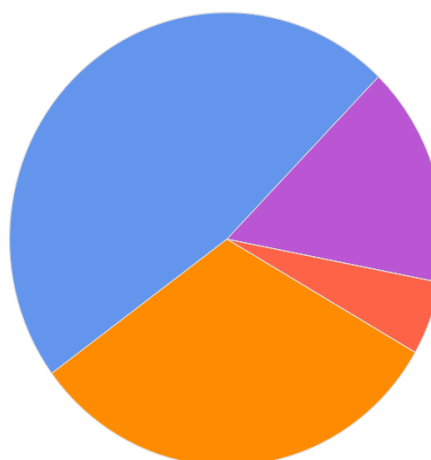
Evaluation Question 3 – How much time is commonly spent in Garden related activities?

Of the respondents who were actively involved in gardening themselves, 55% were involved in garden related activities daily or several times per week, which represents a considerable time outlay for something of benefit to the community. Those who described themselves as 'not directly involved' were excluded. Of those describing themselves as having hands on gardening responsibilities, there was relative greater frequency of activity, 79% working daily or several days per week.

All Respondents - time spent involved with Garden related Activity



Gardeners - time spent involved with Garden related Activity



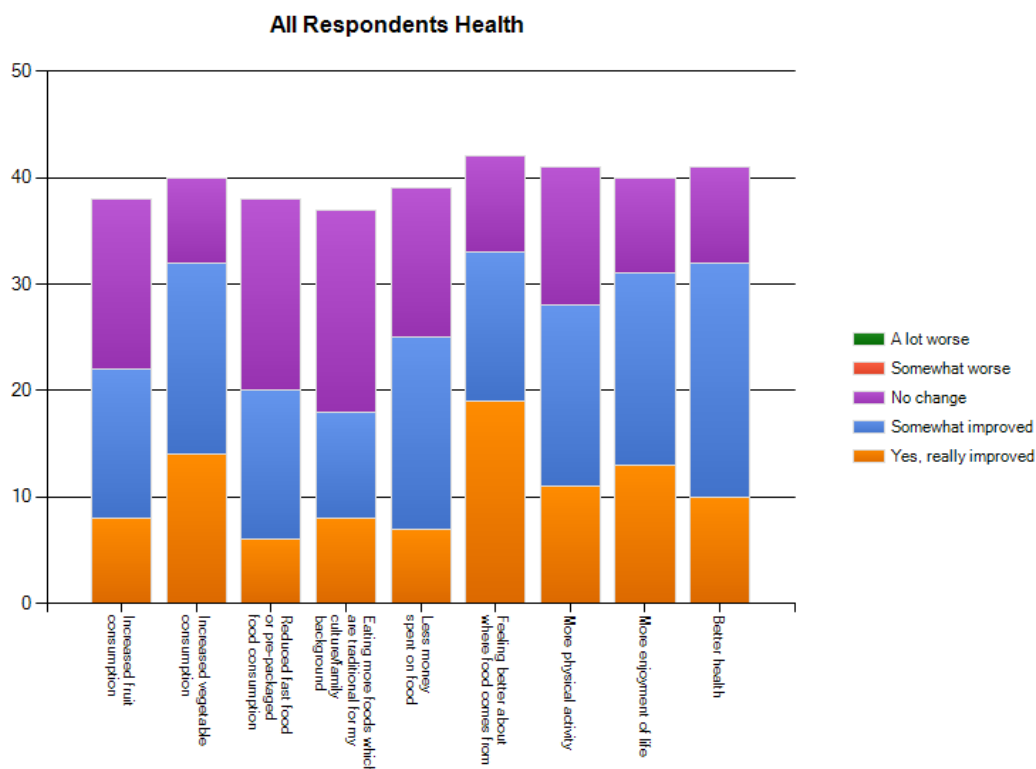
Evaluation Question 4 – What impact has Gardens4Health involvement had on the health of participants in Community Gardening?

Measuring actual health changes is extremely difficult in this sort of setting. Any changes in for example, blood pressure, weight, lipids would be difficult to credit clearly to gardening activity unless taking a fairly complicated approach. One example could potentially be use of biochemical markers such as measurement of urinary pH changes as a proxy measure of fruit and vegetable intake (Welch et al, 2008), however this sort of approach would be inappropriately invasive given the nature of the relationship of Gardens4Health with gardening participants.

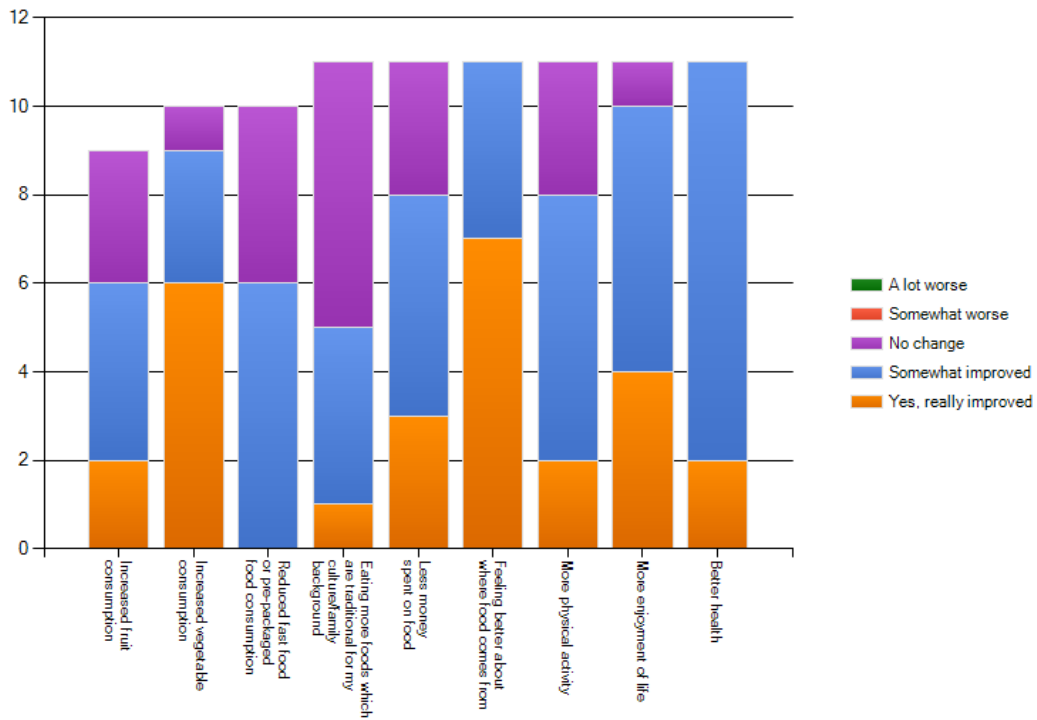
The best option in this situation was self reporting of changes to health status and 9 questions were asked around this topic. Those who indicated that the question was not applicable were excluded and no respondents described a deterioration. Overall the majority of respondents described having ‘really’ or ‘somewhat’ improved health status for all questions around health related areas. It is interesting to note that the impacts went past those who actually did the hands on work in the gardens but extended to individuals in other roles which were more distant. The addition of discussion around fruit and vegetables, and gardening behaviours around for example the work lunch-table appeared to have an effect on team members within for example a workplace or organisation who didn’t work directly with gardening describing improvements.

While self reported improvements to diet in relation to increased fruit, vegetable, cultural and reduced fast food consumption were positive, greatest changes occurred in feeling better about where food comes from, being more physically active, enjoying life and feeling in ‘better health’.

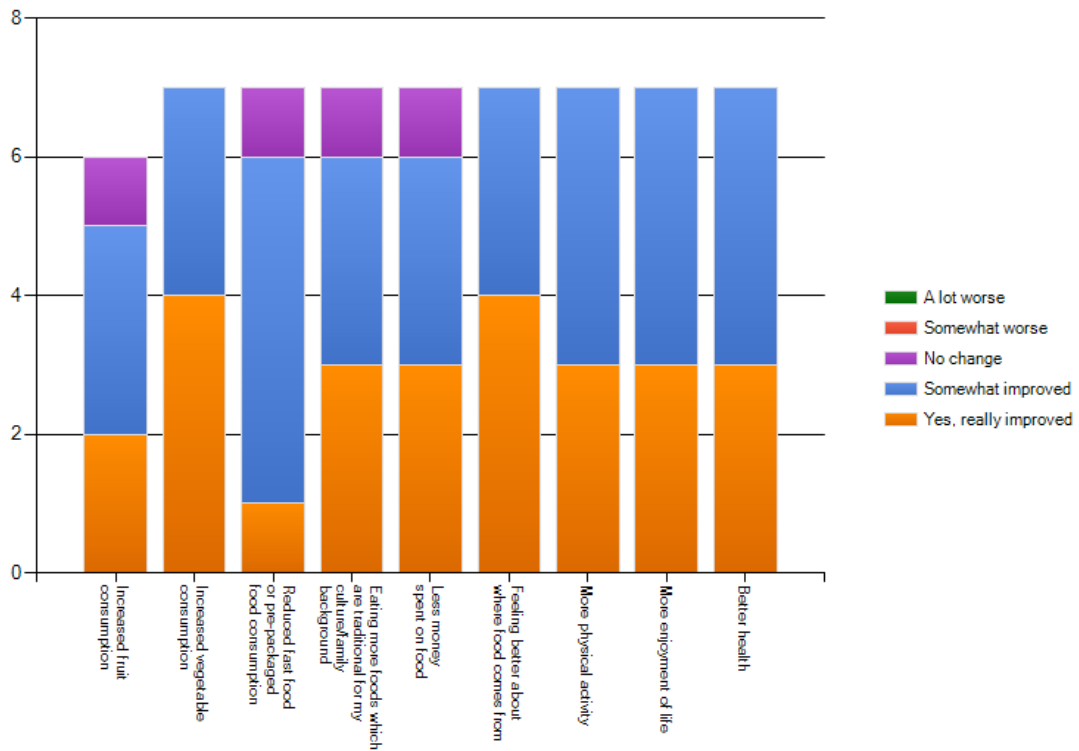
The majority of Maori or Pacific survey participants reported much larger changes in health related behaviours than other groups as evidenced in the following graphs.



All Respondents Maori Health



All Respondents Pacific Health



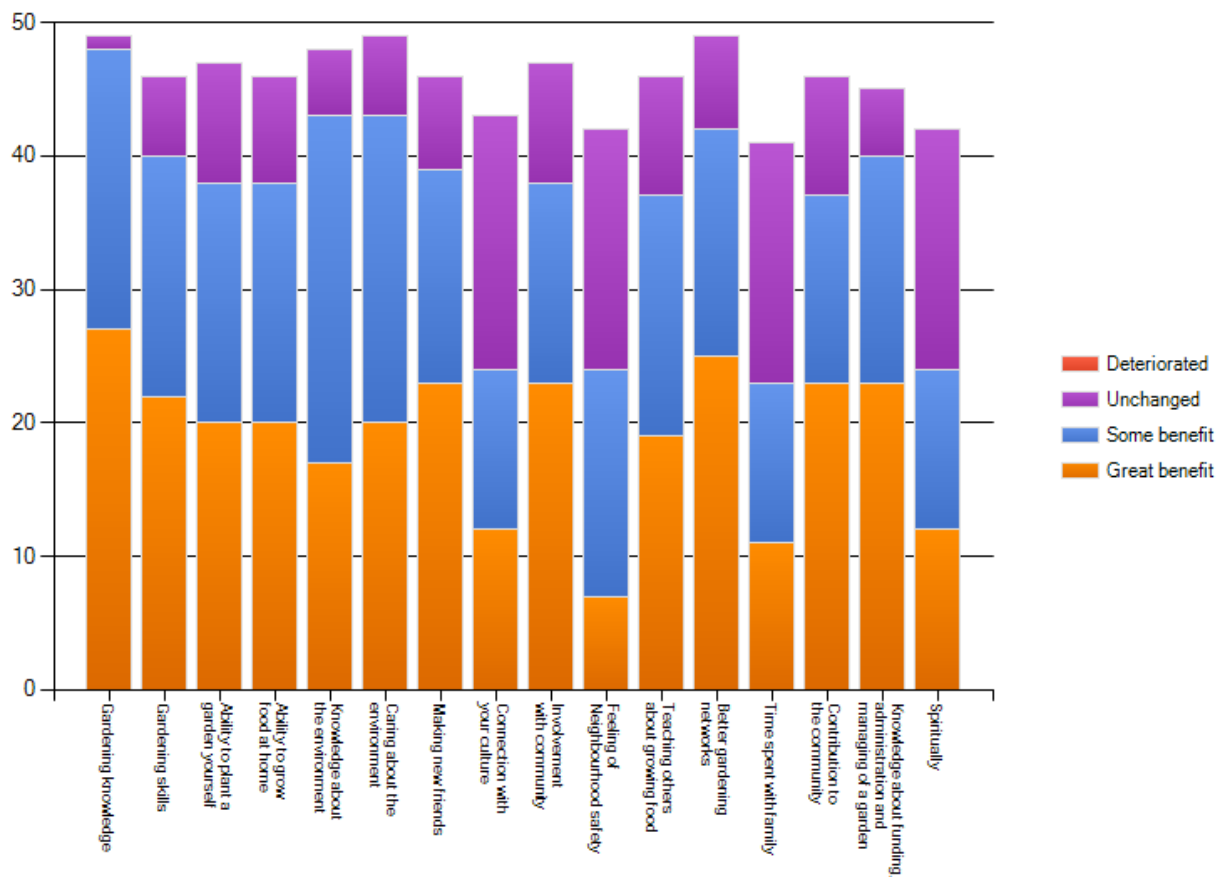
Evaluation Question 5 - What impact has Gardens4Health involvement had on the Community/ environment aspect of the lives of participants?

Respondents were questioned about whether their involvement with Gardens4Health/ community gardening had been beneficial or otherwise around general gardening and community/environmental aspects. There were 16 questions in this section with answer options from ‘deteriorated’ to ‘great benefit’. No respondents selected ‘deteriorated’ as a response to the questions. Those who indicated that the question was not applicable were excluded.

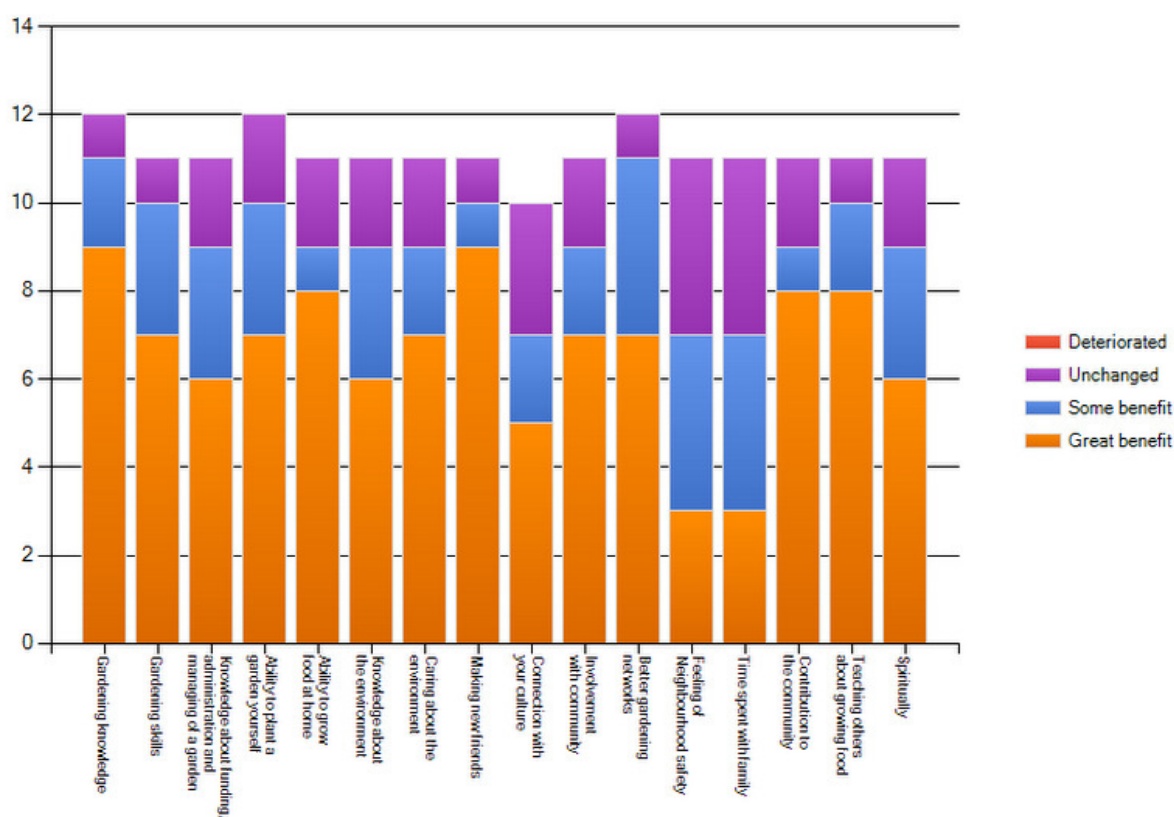
As is apparent from the following graphs, by far the majority of those surveyed felt they had gained ‘some’ or ‘great’ benefit in relation to the items surveyed. Maori and Pacific respondents indicated that they felt that they gained most.

Gardening knowledge was where the most gains were made, however important social areas including ‘making friends’ and ‘networking’ were at the top of the list. A feeling of neighbourhood safety, while still showing some positive improvement was the lowest scorer.

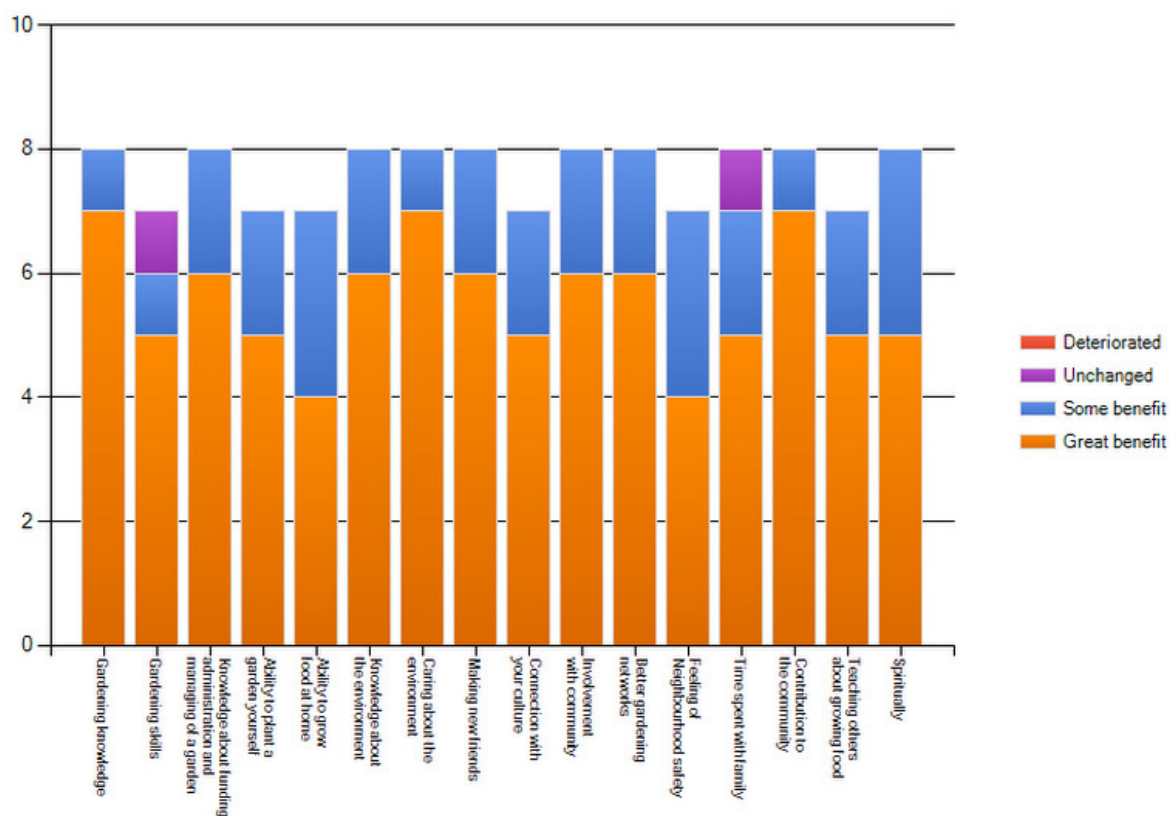
Gardening, Community, Environment - All Respondents



Gardening, Community, Environment - Maori Respondents



Gardening, Community, Environment - Pacific Respondents



Evaluation Question 6 - What impact has Gardens4Health involvement had on garden related knowledge and practice?

98% of Respondents considered that there had been 'some' or 'great' benefit to their gardening knowledge (previous question). More specific questions about the support they received were asked to determine the particular areas of involvement with Gardens4Health/ community gardening which were perceived as being most beneficial or otherwise. There were 20 questions in this section, those who indicated that the question was not applicable were excluded.

The following table describes the results, for all questions with a percentage value for those respondents who found the Gardens4Health impact on their gardening knowledge and practice either 'some help' or a 'big help'. Over 20 questions, for all respondents, 71-98% found Gardens4Health input either a 'big help' or 'some help'.

One respondent found the Gardens4Health input 'wasn't helpful' however this person was clearly expecting something else from the service. Others had their own way of doing things, for example particular cultural ways of gardening (Gardens4Health team members report actively learning different techniques from community gardeners) and building. Some continue to use non-organic practice for pest control and weed management and while organic/sustainable practices are encouraged and information is provided it isn't the role of the Gardens4Health team to challenge or change these practices.

All Respondents

<i>Answer Options</i>	<i>Big help</i>	<i>Some help</i>	<i>Have my own methods</i>	<i>Weren't helpful</i>	<i>% Big or Some Help</i>
Weed management	18	17	3	1	89%
Pest and disease management	17	16	3	1	89%
Organic practices	21	17	3	1	90%
Reduced chemical use	18	13	5	1	83%
Access to water	11	16	7	1	79%
Managing soil health	18	19	3	1	90%
Composting	20	18	2	1	95%
Building & maintaining structures	12	14	9	1	74%
Increasing productivity	16	14	6	1	83%
Use of surplus produce	12	14	8	2	71%
Managing change of season	15	13	7	1	77%
Gardening in all weathers	15	15	6	1	81%
Management of a garden	17	21	2	2	90%
Teaching others	19	17	5	1	88%
Training for me	18	18	5	1	88%
Sourcing funding	16	16	5	1	86%
Use of equipment	15	11	8	1	76%
Growing unfamiliar plants	13	12	8	2	73%
Growing new crops	20	14	3	1	89%
Keeping safe	12	11	10	2	68%

Respondents Identifying as Maori

<i>Answer Options</i>	<i>Big help</i>	<i>Some help</i>	<i>Have my own methods</i>	<i>Weren't helpful</i>	<i>% Big or Some Help</i>
Weed management	8	2	0	1	91%
Pest and disease management	5	3	0	1	89%
Organic practices	8	3	0	1	92%
Reduced chemical use	7	2	1	1	82%
Access to water	4	3	1	1	78%
Managing soil health	8	2	0	1	91%
Composting	9	1	0	1	91%
Building & maintaining structures	4	4	1	0	89%
Increasing productivity	8	1	0	1	90%
Use of surplus produce	7	1	1	1	80%
Managing change of season	8	1	1	1	82%
Gardening in all weathers	8	0	1	1	80%
Management of a garden	6	4	0	1	91%
Teaching others	6	4	0	1	91%
Training for me	5	4	1	1	82%
Sourcing funding	6	3	0	1	90%
Use of equipment	6	3	0	1	90%
Growing unfamiliar plants	5	3	1	1	80%
Growing new crops	9	1	0	1	91%
Keeping safe	4	4	1	1	80%

Respondents Identifying as Pacific

<i>Answer Options</i>	<i>Big help</i>	<i>Some help</i>	<i>Have my own methods</i>	<i>Weren't helpful</i>	<i>% Big or Some Help</i>
Weed management	5	3	0	0	100%
Pest and disease management	5	1	0	0	100%
Organic practices	6	1	0	0	100%
Reduced chemical use	6	1	0	0	100%
Access to water	3	4	0	0	100%
Managing soil health	6	2	0	0	100%
Composting	5	3	0	0	100%
Building & maintaining structures	4	2	0	0	100%
Increasing productivity	6	1	0	0	100%
Use of surplus produce	4	2	0	0	100%
Managing change of season	5	2	0	0	100%
Gardening in all weathers	4	3	0	0	100%
Management of a garden	4	4	0	0	100%
Teaching others	6	2	0	0	100%
Training for me	5	3	0	0	100%
Sourcing funding	5	3	0	0	100%
Use of equipment	4	4	0	0	100%
Growing unfamiliar plants	4	3	0	0	100%
Growing new crops	4	3	0	0	100%
Keeping safe	4	4	0	0	100%

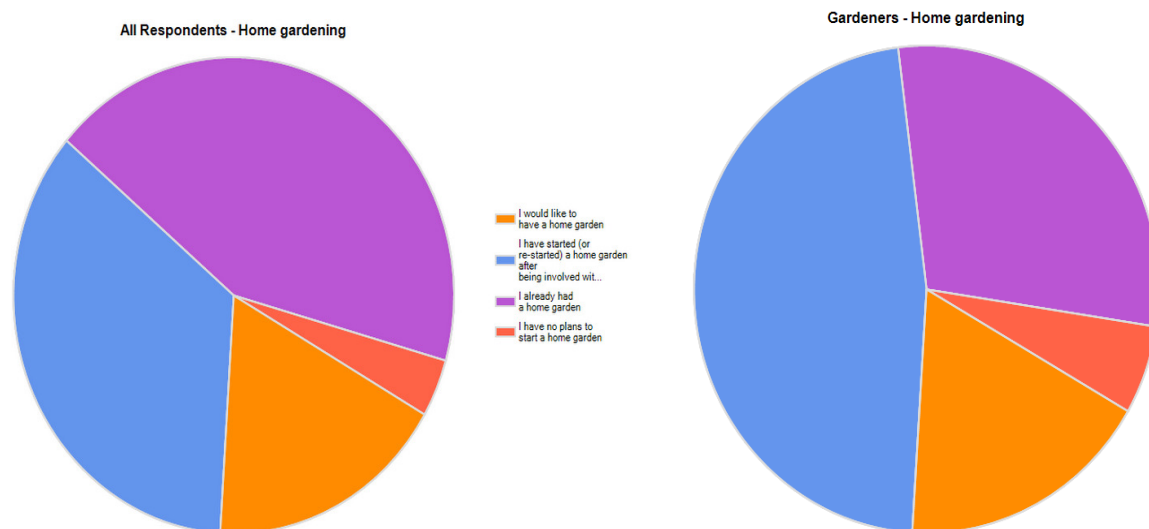
Evaluation Question 7 - How has Gardens4Health impacted on home gardening uptake?

Increased home gardening was a desired outcome of the establishment and support of community gardens. Estimating the scope of new home gardening activity is difficult, the collection of this data in a robust form is outside of this evaluation, however the Gardens4Health team have collected their own data and observe that there has been a growth in home gardening in association with community gardening activities.

Gardens4Health staff make a conservative estimate of home gardens which have been started with some relationship to the community gardens as being around 714. Interest was expressed by a number of respondents in the open answer questions section of the survey about having more specific input into promoting and developing home gardens, typically the Gardens4Health team focus on the community garden and as a secondary activity encourage the application of new knowledge and confidence in the home setting.

One project where Gardens4Health has been involved specifically in home gardening is in the one-off project in conjunction with Refugees as Survivors where funding was sourced from Skycity Community Trust to put together 94 home gardening kits and provide teaching and support to recent migrants to plant their own food gardens in their new homes in the community. This project was very well received, and plans are being made to source funding to repeat it.

Over 50% of respondents to the online survey reported that they had either started a new garden since their involvement with Gardens4Health and community gardening, or wanted to start a garden as shown in the following graphs. When looking specifically at individuals who described themselves as having hands-on gardening roles in their community gardens, 65% fell into this category, the other 35% had other self-identified roles. This highlights the continued change influence on those other than the people actually carrying out the hands-on gardening activities.



Evaluation Question 8 - What do community garden participants find enjoyable or useful about Gardens4Health input?

This question was answered primarily through use of open response questions. 176 responses were gained from the total of 62 evaluation participants over the 3 open questions. All responses were re-looked at together, and re-allocated to particular groups in terms of relevance of points to each other. For example, in the question 14 'other comments', a number of responses were allocated to either 'what was most enjoyed/useful', or 'what could be done better', or 'barriers'. A number of key themes emerged in examining the responses given to the online survey and telephone interviews. These themes are described below and illustrated with example comments where relevant.

Themes identified relating to this topic included:

- Bringing people together, company, working together
- Skills to start, develop and maintain a garden
- Support, knowledge and practical help
- Barriers
- Other issues raised

Bringing people together, company, working together

The community aspect was important to respondents with many comments about meeting and being supported by others:

"All help each other, motivates for people to work together such a permanent thing in peoples lives, so many people with different abilities. Anyone can join in feel very worthwhile when see gardens take off"

"enjoy the team elements, working towards one goal raised my awareness"

"motivates people to work together"

"contact with other gardens really good"

"gardening is very important to our clients"

Regular mention was made of networking, particularly through the partnership meetings:

"G4H is a GREAT forum, and I love being connected and will continue to participate at the greatest level possible"

"meeting a diverse range of people at the meetings"

Skills to start, develop and maintain a garden

There was appreciation expressed for the opportunity to learn about a range of specific things, from particular skills (compost was particularly appreciated), to the garden plans, and the 'helpdesk' type component.

Support, knowledge and practical help

Some expressed change in their own gardener status, how previously they hadn't thought much about it, or had the confidence that they had enough knowledge to garden.

“A city boy, now collecting seeds...”
“Wasn’t much of a gardener originally, now very involved”
“Not a natural greenie, but now more involved...”

Most enjoyed were interactions with staff who were highly praised, as shown in the following examples:

“The staff are an incredible asset...approachability and professionalism of the staff and their overwhelming passion and incredible wealth of knowledge”.
“The tireless support, commitment and passion provided by the G4H team”
“The ongoing support that the G4H team provides is simply the best”
“Congratulations to staff and funders for supporting and being part of this excellent programme”
“Thankyou to G4H staff, your contribution to our garden has been priceless and very much appreciated”
“without the gardens team we would not be here, invaluable resource”

Other Issues raised

“need more volunteers”
“would like more land”
“there is a demand on resources”

Evaluation Question 9 - What can be done better by Gardens4Health?

The majority of respondents indicated that they didn’t want anything changed.

“I think that G4H team are doing a wonderful job and it very hard to see how they can improve”
“nothing – just awesome as they are”

Suggestions made for improvement included:

- Changes to Stakeholder meeting – email backup of ‘round robin’ discussions, change of day (wide range of suggestions, no clear preference here)
- Request for more workshops/teaching or less

“more gardening, less teaching”
“would like more workshops, what to do with vegetables/cooking”
“link to teaching on preserving methods, cooking”

- Specific information – eg, pest resistant crops, funding, operational matters
- More help for home gardens
- Funding/staffing

“it is difficult to identify improvements that could be made at current funding”
“obtain more funding opportunities”
“more staff so they are not spread so thin”

“more expansion in central city communities”
“if they had more resources to help community gardens it would be very useful”
“for the funding they are working off I think they do the best they can”

- Communication

“connect more with other community agencies to work alongside more efficiently”
“newsletter”
“More frequent communication with garden leaders”
“resource documents”

- Other

“be more prepared when organised a workshop”
“make connections between gardening and health benefits more explicit”
“every community centre should be equipped with and edible garden”

Evaluation Question 10 - What do participants in Community Gardens see as barriers to people taking up community gardening?

There were a range of common themes which emerged from respondents when they were asked about what they thought might be barriers to people participating in community gardening, it needs to be noted that these are not necessarily barriers they have experienced themselves. Themes included

- Lack of Knowledge and skills
- Time – this was a common issue raised, busy lives, busy families, finding the time to commit was perceived as difficult
- Funding – regularly raised was the question of firstly funding to start out, but also ongoing funding.
- Transport – raised regularly, participants being able to get to and from gardens, and also transport equipment/produce. Some opportunities for obtaining free material (eg, reject seedlings) were unable to be acted on because of transport.
- Drive - hard to get going, “laziness”, thinking gardening was “too hard”, lack of interest.
- Cultural and Social – there were comments regarding the worry that there might be “hostility to ethnic differences”, “non-inclusion”, “language and cultural barriers”, “feeling intimidated”, “concern that cultural food might not be valued”
- Personal issues such as shyness, fear of theft, personal fitness/health, worry about loss, uncertainty about own skills, past experience.
- Other – dealing with council, paperwork, health and safety concerns, responsibility, liability, not having right contacts

Discussion

Examining the results of both the ethnicity as reported by the gardening team and the ethnicity self reported by those in the survey, it appears that the gardening for health programme is reaching an ethnically diverse population, with Maori and Pacific people making up a higher proportion of those participating in the Gardens4Health Programme than reflected in the survey/interview results, and proportionately higher than present in the Counties Manukau DHB population. Nutritional health and well-being outcomes are often reported as being worse for Maori and Pacific peoples than for the European population, so this representation from higher risk groups is very positive.

With online survey data collection there is always the risk that results may be biased towards those who are most likely to have regular access to the Internet, i.e. the young and those of higher socio-economic status or educational attainment. Interviews were carried out with those who were less likely to be represented in the online data collection and while the finding was that there was little in the way of additional data collected, caution should be observed when attempting to extrapolate from information which isn't representative of participants.

It is positive to see the age spread of the respondents in the online survey as this suggests that, at least in part, the commonly held perception that gardening is an activity just for the elderly and retired isn't being reflected here. It is encouraging that these members of later generations may be in a position to pass gardening knowledge and skills on to those still younger, and that skills aren't so at risk of being lost between generations. It would be interesting to explore the characteristics of the different age groups, including what barriers and enablers are specific to particular ages.

Community based projects require leadership, and leaders from communities may well influence the mix of individuals who participate in the particular community garden. Examining the multiple roles needed to run a successful community garden, it appears that to further extend the scope of community gardening, models of train-the-trainer or peer support of a senior garden leader could be used to encourage a less experienced garden leader and may help encourage the development of new gardens. In addition, the role of administration and support cannot be underestimated with around quarter of participants commenting on this as being part of the role. Whether or not this role is clearly defined and or appropriately resourced may impact on whether or not new gardens can be successfully developed in the future.

As with all surveys it is most likely that the more committed and more positive members of a community will be likely to respond, and it is remarkable to see the sheer number of hours some individuals give up to participate in the Community Gardens. It is however important to recognise that not all individuals who want to be part of such a scheme can contribute this much time. There are a number of barriers to participation which would be difficult to overcome e.g. employment commitments. However some may have solutions which already exist in the settings of the community gardens. Finding ways of looking after children or elderly family members on or near the garden site would allow individuals who might not otherwise be able to participate to contribute some of their time. It is important to remember that a small child or a frail elderly person may be able to participate in some gardening activities but they also need areas to rest and be comfortable particularly during times of adverse weather. It would be interesting to look at whether gardens attached to schools, churches, or community meeting areas i.e. Marae could attract people with caring commitments if these facilities could be used for the care of those needing such care.



With at least 50% of participants reporting positive improvement in their health across all nine health related measures in the survey, it suggests that there is a potential for substantial impact on health from community gardening, which may be greater still for those of Maori or Pacific ethnicity. The actual impact of these kind of behaviour changes on long-term health outcomes is difficult to measure, however repeated epidemiological studies have indicated that increased fruit and vegetable consumption, reduced fat intake and increased physical activity are all predictive of better health outcomes. The health questions in the survey included four questions capturing different domains of Hauora, around culturally specific food, financial benefits of gardening, food localism and life enjoyment. All these questions achieved positive responses in at least half of all participants suggests that the program is meeting a wider health agenda than just the physical health agenda.

This is further explored in the 16 questions associated with community and environment. At least three quarters of respondents benefited in terms of gaining knowledge around gardening and the skills required to tend the garden either in the community or in their own home. The program heightens both the knowledge about and care for the environment for over 8/10 of all participants. For many individuals living in urban environments, once they have left formal education there is little opportunity to pick up new skills, unless those skills are either work based or exist in the family already. The Gardens4Health Programme provides the opportunity for people to be "learners together", reducing the stigma of not having skills and knowledge about particular areas. The increased knowledge and care of the environment suggests that the gardening proceeds as a source of pride, reducing the likelihood of mindless and negative behaviour that would be destructive to the immediate environment e.g. dropping litter. In an environment where there is the opportunity to learn together and participate in activity that will generate self-esteem it is unsurprising that almost 90% of respondents found that they were making new friends. It is interesting to note that both Maori and Pacific respondents felt that there was the positive benefit of greater connection to your culture as part of participation in these gardens. One response which appears to be contradictory is while most people felt this increased the sense of involvement with community there was less improvement in the feelings of neighbourhood safety. Is this in part a result of these schemes being relatively small in a wider community context? This reflection leads to the question of how to increase participation by more people within communities.

The model of shared learning used in the Gardens4Health scheme may well have influenced the response to both teaching others about growing food and knowledge on funding and administration of gardening projects, rather than a top-down approach to learning this program focused on facilitated dissemination of shared knowledge. It is likely that there will be a "ripple effect" from these gardens where members of the family who did not attend could pick up knowledge and skills from those attending, the impact of which would be interesting to measure at a later stage.

It is interesting to note that among respondents there was very little resistance to sustainable and organic garden management practices, with only a few respondents having other methods. The non directive style of "learning together" which is supported by the gardens for health scheme may plant ideas for those who resist these innovations, permitting them to try them later. Sustainable and organic practice will hopefully result in long-term benefits to both individuals and the environment.

Another aim of the Gardens4Health scheme was to increase the number of home gardens by those participating in the community garden scheme; it is still likely to be a major financial barrier which prevents individuals starting your own home garden, as they will need seeds and equipment to start the process. If the estimate of home garden development can be

assumed to be accurate then an impact of the Gardens4Health involvement in community gardening has been nearly 50% of participants in the program now having a garden. Even small plots producing only a few vegetables and fruits would have an impact on the number of servings of these foods each day and this measure of consumption per day has strong inverse correlation with many chronic diseases such as type 2 diabetes and heart disease.

Further evaluation, possibly through use of open, semi-structured interviews or ethnographic observations may be needed to determine if there is an effect of increasing family participation through community gardens as a result of the Gardens4Health programme. It can be presumed that through school and early childhood settings children will both undertake gardening activities and will see the positive role modelling of garden participation by their adult family members, but is this the case in gardens outside these specific settings? Also, does this continue once the child is able to be left to care for themselves independently of adult supervision, or does the teen still come to participate.

Many of the aims of the Gardens4Health scheme will not be easily measured or measured in the timeframe of the programme. The epidemiological impact of fruit and vegetable intake and physical activity is well known, but in individuals is hard to separate out from other factors which influence health. This can equally be said of trying to measure “soft outcomes” such as “improved family and other relationships”. Proxy measures such as ongoing participation and positive emotional responses by the participants are valid in estimating how the Gardens4Health scheme might impact on interpersonal relationships. It is interesting within the qualitative responses that there was fear that there would be cultural insensitivity found within gardening groups, and it appears that this was not the case for the participants who responded to the questionnaires or were interviewed. Further ethnographic study of garden groups might help identify what kinds of actions or behaviours reduce the fear of “exclusion”, and from that, if there are problems in other future gardens of cultural differences impacting on participation, these could be targeted through training for leaders. Health improvement measurements from the Gardens4Health programme will be felt over many years, as it is recognised that the minor dietary changes that improved access to fruit and vegetables, and their displacement of higher fat convenience foods will affect both the health of adults and children in this generation, and in the generation to be born. Individually that impact may be small, but the impact across a population can be large, if it reduces the incidence or delays the onset of chronic diseases. In the shorter term, if gardening improves people's mental well being and other domains of their health are improved through social engagement, then this is a major positive outcome from Gardens4Health.

Overall, there is a strong suggestion from this analysis that the Gardens4Health project meets the aim of improving health and wellbeing, expanding knowledge, increasing gardening, strengthening communities, and is working towards the proliferation of home gardening.

Recommendations

Longer term funding for Gardens4Health would allow planning for ongoing sustainability of existing gardens, and for continuing new gardens to be established. This is particularly important for example in the development and retention of key staff, development and maintenance of trust based relationships in the community and with organizations, and to minimize the impact of the seasonal nature of gardening through consistent presence.

Leadership is key to both sustainability of existing gardens and the prospect of future gardens starting. The Gardens4Health scheme takes the approach of helping “grow”



leadership through a “learn together” model of information dissemination, this approach requires a commitment over the longer time frame (as above). If a longer time frame can be gained, a more formalized structure for developing identified leadership could be planned and put into place. There is also the possibility of focus on specific groups, for example, Gardens4Health could investigate the idea of a “youth leadership” scheme, where middle to older teens are given the chance to develop skills and participate in decision making about the gardens. This would promote the skills of gardening as being valuable across the life course, and the right youth leaders could promote gardening as “cool” to other teens.

Increase the range of benefits to participants through formalizing relationships with suppliers/funders and rationalizing such issues as transport.

Further work on communication, including potential development of a newsletter.

Greater linkages and formalized referral pathways to providers who can help train gardeners in the use of their produce. This will obviously be dependent on capacity of providers and whether such usage meets funding specifications.

There are a range of areas where further investigation could be useful. The worrying finding that there were concerns around barriers related to culture and acceptance is worth looking into. The diverse roles and particular skill-sets which are important in community gardening could give pointers into where developmental support could be better targeted. Further research into the wider impact of community and home gardening on family behaviours, particularly in relation to health behaviours of children into the future would lend itself to programme improvement. Further research to understand the dynamics of group formation and ongoing development could inform and reinforce positive outcomes, and this is far more easily measured than health improvement measures. Encouraging partnership working with health researchers would be a positive move to achieve some of this, and there is a variety of approaches which could be explored, for example, ethnographic and social marketing studies could further inform how to encourage participation by those groups not participating.

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