

# Evaluation of the Fruit and Vegetable Co-op

## Final report of survey results

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**Canterbury**  
District Health Board  
Te Poari Hauora o Waitaha

Report prepared for the Communities Team  
by the Information Team  
Community & Public Health, CDHB  
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## Executive summary

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### Background

The Fruit and Vegetable Co-op is a health promotion partnership between Community and Public Health, the Christchurch Anglican Cathedral, and the communities of Christchurch. The aim of the project is to increase the quantity and variety of fruit and vegetables consumed among participating families by providing low cost fresh fruit and vegetables.

The project has experienced rapid growth since it began in September 2011, and currently more than 2,000 packs of fruit and vegetables are ordered each week. There are now seven packing hubs, and the number of distribution hubs has grown from one to 40.

### Methods

A survey was conducted to evaluate the impact of the Fruit and Vegetable Co-op on members, and to provide information to guide the Communities Team's future involvement with the Co-op. A convenience sample of 345 Co-op members from 18 randomly selected distribution hubs was surveyed.

### Findings

The main findings include:

- One fifth of respondents lived in areas with the highest deprivation scores (NZDep2013 deciles 9-10), and a further 38% lived in areas with moderate deprivation scores (NZDep2013 deciles 6-8).
- Over 80% of respondents used the Co-op to save money.
- Over 40% of respondents had been using the Co-op for more than one year.
- More than 90% of the respondents ordered the bags of fruit and vegetables for their own household.
- As well as using the Co-op, nearly 80% of respondents also got fruit and vegetables from elsewhere.
- Three quarters of respondents used the recipe cards provided in the bags.
- Many respondents (85%) read the health information on the back of the recipe card.
- Over 80% of respondents reported eating two or more servings of fruit, and over 60% reported eating three or more servings of vegetables per day. No significant difference in fruit and vegetable intake was found between Māori respondents and non- Māori respondents
- Almost three quarters of respondents reported that they ate more fruit and vegetables since they began using the Co-op.
- One in every five respondents was a volunteer for the Co-op.
- One quarter of respondents relied on others to provide food and/or money for food, for their household 'often' or 'sometimes'.

## Conclusions

Through active community involvement this cross-organisational collaboration provides greater access to fresh produce at a low price to members, some of whom may otherwise struggle to afford fruit and vegetables. As a result, members report an increase in the quantity and variety of fruit and vegetables consumed. The Co-op has increased opportunities for volunteering and social interaction, and for CPH to distribute healthy cooking and general health information more widely. This positive community-focussed model has the potential to further enhance well-being and food security in areas of high need.

## Recommendations

Based on the findings of this evaluation, it is recommended that the Communities Team continue to:

- Support the Fruit and Vegetable Co-op and provide recipe cards and health information for inclusion in the packs. The team might also consider providing recipes with options for vegetarians or one-person households, and recommending food skills-based programmes (such as Senior Chef).
- Maintain the information on the Co-op page of the CPH website regularly, as well as provide updated material to those managing any other related sites (e.g. Facebook groups).
- Work with Co-op collaborators to:
  - inform specific community groups and services, and larger organisations of the Co-op and encourage them to refer people from high-need population groups
  - develop strategies to increase vegetable consumption by Co-op members, especially new Co-op members, and
  - develop a long-term plan to ensure the viability and sustainability of the project, including recruiting and maintaining a large pool of volunteer personnel.
- Consider working with the Information Team to develop a long-term evaluation plan to collect data at regular intervals.

## Table of contents

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Evaluating the Fruit and Vegetable Co-op .....	1
Background .....	1
The current survey .....	4
Methods.....	5
Evaluation objectives .....	5
Survey methods .....	5
Findings .....	8
Characteristics of respondents .....	8
Sources of initial information about the Co-op .....	10
Motivations for using the Co-op .....	10
Extent to which respondents used the Co-op .....	11
Use of recipe cards and health information .....	12
Usual fruit and vegetable intake.....	13
Changes that have occurred since members began using the Co-op.....	16
Indicators of food security .....	17
Additional comments regarding the Co-op .....	18
Discussion.....	21
Characteristics of respondents .....	21
Respondents' use of the Co-op.....	22
Effects of Co-op participation .....	23
Limitations .....	27
Conclusions .....	28
Recommendations .....	29
Appendix 1: Questionnaire .....	30
References .....	34

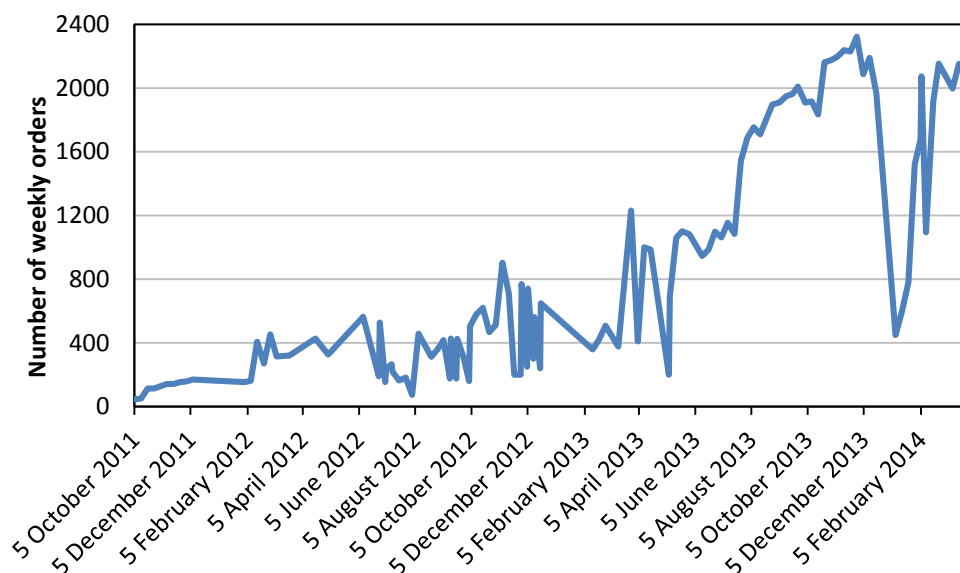
# Evaluating the Fruit and Vegetable Co-op

## Background

The Fruit and Vegetable Co-op<sup>1</sup> is a health promotion partnership between Community and Public Health (CPH), the Christchurch Anglican Cathedral, and the communities of Christchurch. The Co-op began as a collaborative initiative between CPH and the Cathedral as a response to the February 2011 Canterbury earthquakes. This initiative was an expansion of an existing fruit and vegetable co-op based at St Aidan's Church in Bryndwr, where an Anglican vicar was one of the key buyers. The aim of the project is to increase the quantity and variety of fruit and vegetables consumed among participating families by providing low price fresh fruit and vegetables.

The project began in September 2011 in the Eastern suburbs of Christchurch, which was the area most severely affected by earthquakes. One distribution hub was set up and 86 members joined the Co-op. Over a two-year period, Co-op membership increased dramatically and currently more than 2,000 packs of fruit and vegetables are ordered each week (Figure 1).

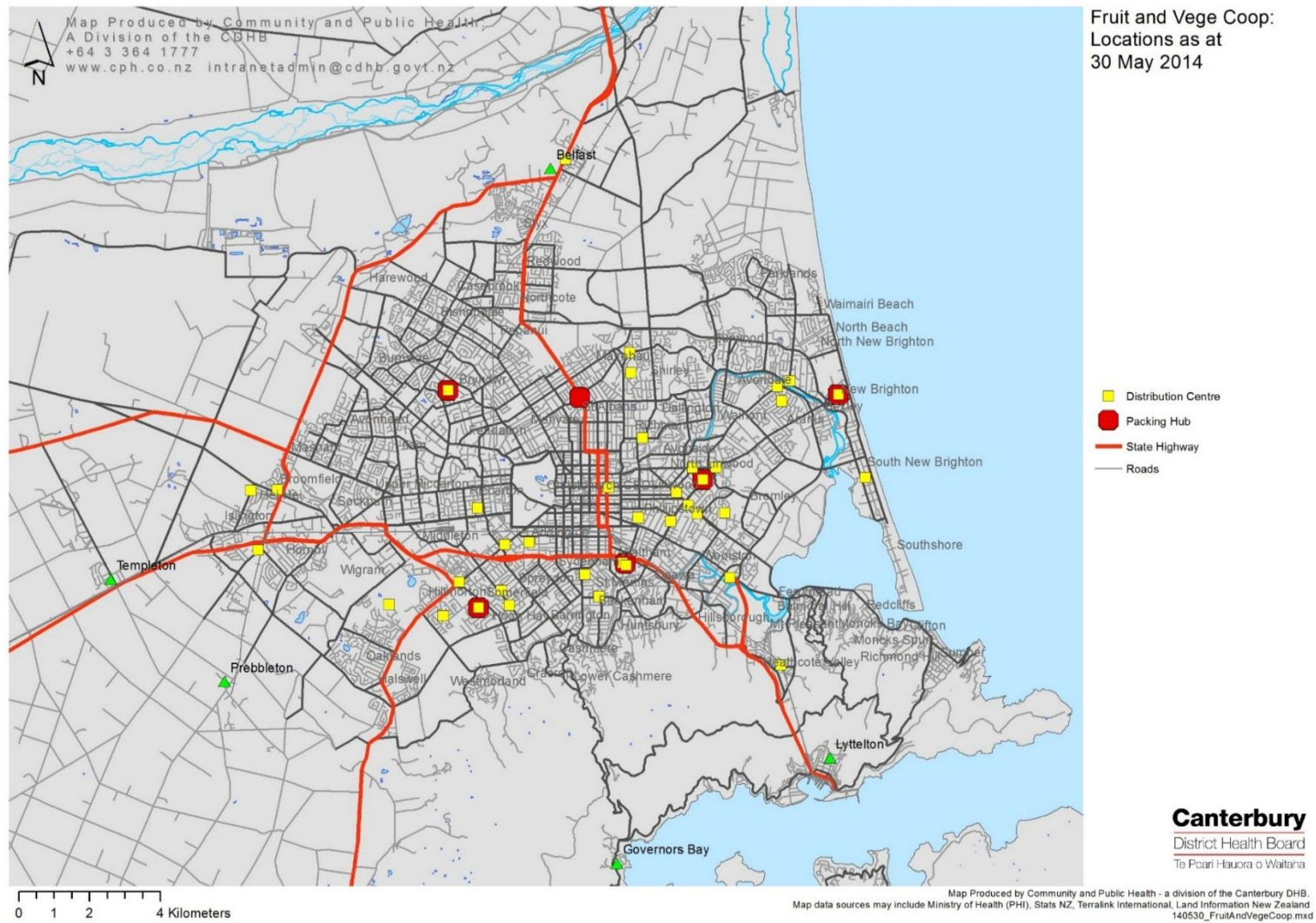
**Figure 1. Number of weekly orders placed between 5 October 2011 and 31 March 2014**



There are now seven packing hubs and the number of distribution hubs has grown from one to 40 (Figure 2. Note that one packing hub is in Rangiora, which is not shown on the map). As can be seen in Figure 2, the majority of hubs are situated in the eastern and southern suburbs.

<sup>1</sup> <http://www.cph.co.nz/About-Us/Fruit-and-Vegetable-Cooperative/>

**Figure 2. Location of distribution and packing hubs in Christchurch**





The Cathedral provides vegetable buying expertise and liaises with new Co-op groups, and community groups provide volunteer packers and distributors. CPH provides community networks, recipes, health information and community support.

On a Tuesday, the buyer from the Cathedral purchases a selection of fruit and vegetables based on value for money. All fruit and vegetables are purchased from a leading supplier of fresh produce, MG Marketing, in Hornby. On Tuesdays or Wednesdays, volunteers help with packing the fruit and vegetables and distributing the orders to the distribution hubs (Figure 3). Members order and pay in advance, and collect their packs during a pre-determined window from one of these hubs. Each pack of fruit and vegetables costs \$10 and weighs approximately 8kg (Figure 4).

**Figure 3. Packs of fruit and vegetables in a hub**



**Figure 4. An example of the variety of fruit and vegetables included in one pack**





Also included in the pack is a card with a recipe (utilising one or more items of produce contained in the pack) on one side and health information (e.g. healthy eating, smoking cessation, how to stay warm in winter) on the other side. In addition, there are occasionally cooking demonstrations and tastings of the recipes at the distribution hubs.

In 2012, a survey of Fruit and Vegetable Co-op members was conducted investigating the impact of Co-op participation on fruit and vegetable consumption (Community & Public Health, 2013). It found that one year after joining the Co-op, members reported eating significantly more fruit daily, and most of them had also tried new varieties of fruit and vegetables. However, there was no increase in the average reported amount of vegetables consumed daily

### **The current survey**

The Information Team was requested by the Communities Team to evaluate the impact of the Fruit and Vegetable Co-op on members, and to provide information to guide the team's future involvement with the Co-op. For this evaluation, a survey was conducted of a convenience sample of Co-op members from randomly selected distribution hubs.

A preliminary report was prepared in May 2014, which presented a summary of the findings of that survey. This final evaluation also includes a discussion of findings of the survey, the inclusion of deprivation data from the 2013 New Zealand Census, and recommendations for the Communities Team.

## Methods

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### Evaluation objectives

The objectives of this evaluation are to:

1. determine the demographics of Co-op members
2. determine the extent to which members use the Co-op
3. identify the motivations of members to be part of the Co-op
4. identify any changes that have occurred since members joined the Co-op
5. assess whether members use the recipe cards for preparing and cooking vegetables, and read the health information on the back of the recipes, and
6. assess the current fruit and vegetable intake of Co-op members

### Survey methods

To address the evaluation objectives, a survey of Co-op members was conducted.

#### Survey sample size calculation

The target population was current Co-op members. At the time of planning the survey, it was estimated that there were approximately 1,500 current members. The alpha level was set a priori at 0.05 and the level of acceptable margin of error at 5%.

For practical reasons, a cluster-based sampling method was used. Eighteen of the 40 distribution hubs were randomly selected using a random number generator in Microsoft Excel, then a convenience sample was used at each selected hub.

For a simple random sampling method, the required sample size was 306 members. However, as a simple random sampling method was not used, the sample size was increased to 350 to achieve equivalent precision in estimating the population.

#### Questionnaire development

The paper-based questionnaire was developed by two Information Team Analysts (CPH) in collaboration with members of the Communities Team (CPH). See Appendix A for a copy of this questionnaire.

Some questions in the questionnaire were sourced from other New Zealand surveys to allow comparisons with recent national data. These included questions relating to:

- ethnicity, from the 2013 New Zealand Census (Statistics New Zealand, 2013)
- age, from the 2012/2013 New Zealand Health Survey (Ministry of Health, 2012c)
- daily fruit and vegetable consumption, from the 2012/2013 New Zealand Health Survey (Ministry of Health, 2012c), and

- food security<sup>2</sup>, from the 2008/2009 Adult National Nutrition Survey (Ministry of Health, 2008), and from an index of socioeconomic deprivation for individuals (NZiDep) (Salmond, Crampton, King, & Waldegrave, 2006, 2007).

### Survey implementation

From 24 February to 28 March 2014, two staff members from the Communities Team went to 18 different distribution hubs to conduct the survey. The order in which the hubs were surveyed was randomised. All Co-op members who were present at the hub on the day orders were to be picked up were approached and asked to participate in the survey. Those who agreed to participate either:

- filled out the questionnaire themselves at the distribution hub
- filled out the questionnaire along with a Communities Team member (where questions were read aloud and responses written down by a Communities Team member), or
- took the questionnaire home, filled it out, and brought them back to the hub the following week.

A total of 511 questionnaires were distributed to members. A total of 227 questionnaires were filled out with Communities Team members, and 118 were filled out by Co-op members themselves. The overall response rate was 67.5%.

### Data entry and analysis

A data entry template was created in Microsoft Excel prior to the commencement of data collection. On the return of the completed questionnaires each week, survey data were entered in the Excel file by the Communities Team Administrator.

Quantitative data analysis was undertaken using SPSS (version 17.0, SPSS Inc. Chicago, IL, USA). All percentages were calculated as a percentage of those who responded to the question (i.e. excluding missing responses). Chi-square analysis was used for comparisons of categorical variables in sub-groups.

To determine the level of deprivation of the neighbourhood where each respondent resides, respondents were asked to provide their street name and suburb. After data entry, the lowest street number within the stated suburb was assigned to each address. These addresses were geocoded and assigned to corresponding meshblocks, then deprivation index scores (NZDep2013<sup>3</sup>) (Atkinson, Salmond, & Crampton, 2014) were obtained at meshblock level using Health-e-Address (Health

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<sup>2</sup> Food security is a term that encompasses the ready availability of nutritionally adequate and safe foods, and the assured ability to acquire personally acceptable foods in a socially acceptable way (Russell, 1999).

<sup>3</sup> NZDep2013 is a small-area-based relative deprivation index based on nine socioeconomic variables from the 2013 Census. NZDep2013 scores are usually categorised into tenths (deciles), numbered from 1 (least deprived) to 10 (most deprived). NZDep2013 describes the deprivation experienced by groups of people in small areas and describes the general socio-economic deprivation of an area. It does not describe the deprivation of an individual. <http://www.otago.ac.nz/wellington/research/hirp/otago020194.html>

Identity Programme, Ministry of Health<sup>4</sup>). Unfortunately it was not possible to geocode the addresses and determine the NZDep2013 score for 26 respondents due to illegibility of written addresses and missing responses.

To provide further detail, free text comments were analysed by identifying the main ideas and themes.

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<sup>4</sup> <http://www.health.govt.nz/our-work/health-identity/addressing-and-geocoding>

## Findings

A total of 345 Co-op members from 18 distribution hubs participated in the survey. The median number of members who completed the survey (i.e. respondents) per hub was 14. However, the number of respondents per hub varied widely depending on the size of the hub - ranging from five in a small hub to 63 in a large hub.

The following sections detail the results of the survey.

### Characteristics of respondents

Over one fifth of respondents (21.7%) had two members in their household, and over one quarter (26.2%) had four members. A further one fifth of respondents (20.4%) had five or more members in their household.

**Table 1. How many members do you have in your household?**

Number of household members	Number of responses*	Percentage of respondents (%)
One	46	13.7
Two	73	21.7
Three	60	17.9
Four	88	26.2
Five	48	14.3
Six or more	21	6.1

\* 9 missing responses.

The majority of respondents (92.4%) identified as European (of these 314 respondents, 308 were New Zealand European). Over 12% identified as Māori, and a further 3.5 % as Pacific.

**Table 2. Which ethnic group do you belong to?**

Ethnic group	Number of responses†	Percentage of respondents (%)*
European	314	92.4
Māori	41	12.1
Pacific	12	3.5
Asian	5	1.5
Middle Eastern/Latin American/African	4	1.2
Other‡	6	1.8

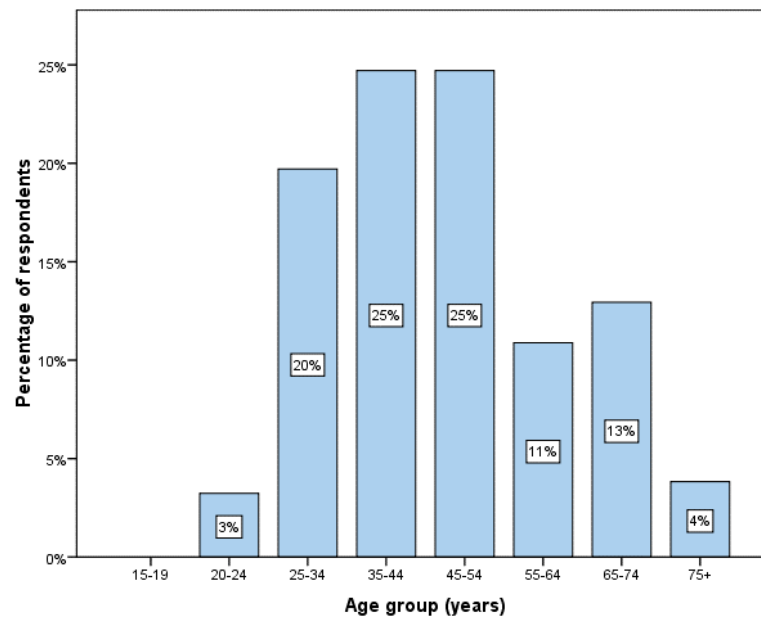
† 5 missing responses.

\* People who reported more than one ethnic group are counted once in each group reported. This means that the total number of responses for all ethnic groups can be greater than the total number of people who stated their ethnicities.

‡ Includes five respondents who stated that their ethnicity was “New Zealander”, “Kiwi” or “Pākehā”, as well as one person whose ethnicity was not included in the list above.

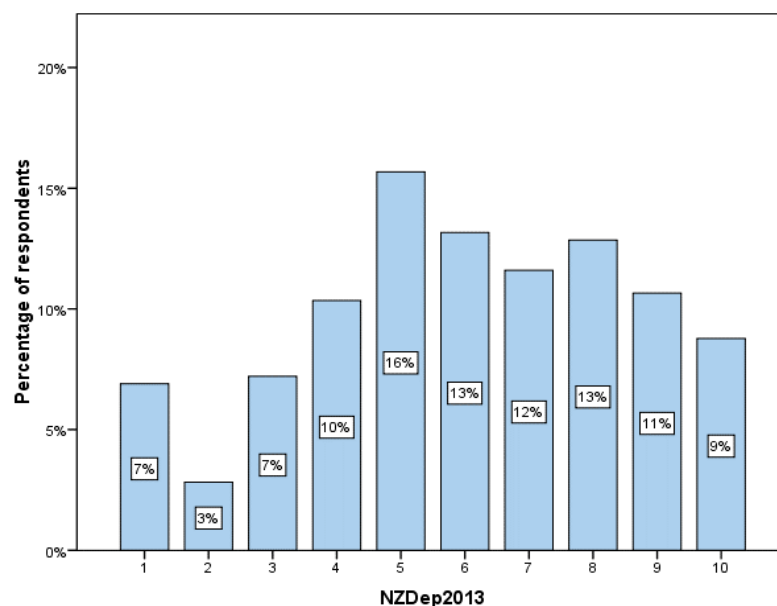
All respondents (excluding five respondents who did not state their age) were aged 20 years and older (Figure 5). Half of the respondents (49.5%) were aged between 35 to 54 years. Over 15% were aged 65 years and older.

**Figure 5. Which of these age groups do you belong to?**



Twenty percent of respondents lived in neighbourhoods with the highest deprivation scores (NZDep2013 deciles 9-10), and a further 25% lived in areas with moderate deprivation scores (deciles 7-8) (Figure 6, 26 missing responses).

**Figure 6. Level of deprivation of the neighbourhoods where respondents lived**





## Sources of initial information about the Co-op

Over half of respondents heard about the Co-op through their friends or family members. Eleven percent heard about the Co-op through their church, and seven percent through the CPH website. Seventy-seven respondents (22.3%) indicated that they heard about the Co-op through other sources, including via:

- a community centre, group, garden or programme (n=25)
- written information - e.g. community newsletter or email (n=12)
- a service provider - e.g. Work and Income New Zealand, Plunket, Budget Advisory Service, nurse, doctor, hospital (n=12)
- a school (n=11)
- posters (n=6)
- work or work colleague (n=4)
- word of mouth (n=3)
- noticing the Co-op in the neighborhood - e.g. living near or driving past a hub (n=2)
- radio (n=1), and
- a web search (n=1).

**Table 3. Where did you hear about the Co-op?**

Sources	Number of responses <sup>†</sup>	Percentage of respondents (%) <sup>*</sup>
<b>CPH website</b>	23	6.7
<b>Facebook</b>	27	7.8
<b>Friends or family</b>	188	54.5
<b>Newspaper</b>	20	5.8
<b>My church</b>	38	11.0
<b>Other</b>	77	22.3

<sup>†</sup> 1 missing response.

<sup>\*</sup> Respondents could choose more than one category, therefore the percentages do not sum to 100%.

## Motivations for using the Co-op

Over 80% of respondents reported that they used the Co-op to save money, and more than 65% because it helped their families to eat more healthily. Twenty three respondents listed other reasons for using the Co-op, including:

- the greater variety, or to try different types, of fruit and vegetables (n=8)
- the quality of fruit and vegetables (n=5)
- to support a local community initiative (n=5)
- to help others (n=2)
- because they couldn't otherwise afford fruit and vegetables (n=2)
- because they liked it (n=2), and
- to be able to eat more fruit and vegetables (n=1).

**Table 4. Why do you use the Co-op?**

Motivations for using the Co-op	Number of responses <sup>†</sup>	Percentage of respondents (%) <sup>*</sup>
<b>It helps my family to eat more healthily</b>	234	67.8
<b>To save money</b>	284	82.3
<b>To save time shopping</b>	105	30.4
<b>It is close to where I live/work</b>	125	36.2
<b>I like meeting other people and socialising</b>	60	17.4
<b>I am a volunteer as well as a customer</b>	54	15.7
<b>Other</b>	23	6.7

<sup>†</sup> 1 missing response.

<sup>\*</sup> Respondents could choose more than one reason, therefore the percentages do not sum to 100%.

## Extent to which respondents used the Co-op

Most respondents (over 80%) had been using the Co-op for more than three months. Among them, half had been a member for more than one year.

**Table 5. How long have you been using the Co-op?**

Time since started using the Co-op	Number of responses <sup>*</sup>	Percentage of respondents (%)
<b>Less than 3 months</b>	63	18.4
<b>4-12 months</b>	139	40.6
<b>More than 12 months</b>	140	40.9

<sup>\*</sup> 3 missing responses.

Nearly 70% of respondents placed one order (i.e. one bag of fruit and one bag of vegetables for \$10 in total) each time they used the Co-op. Seven percent made three or more orders each time.

**Table 6. How many order(s) do you order each time?**

Number of orders	Number of responses <sup>*</sup>	Percentage of respondents (%)
<b>One</b>	235	69.3
<b>Two</b>	80	23.6
<b>Three or more</b>	24	7.0

<sup>\*</sup> 6 missing responses.

Most respondents (93.5%) ordered bags of fruit and vegetables for their own household. Sixteen percent also ordered for other family members who did not live with them, and another 14% ordered for their friends. Among these respondents, 27% ordered fruit and vegetables for both themselves and others. Nineteen respondents listed other people or groups that they ordered bags for, including:

- neighbours (n=6)

- people who need assistance – e.g. due to low income, lack of transport, or a disability (n=5)
- work colleagues (n=3)
- an acquaintance (n=2)
- a community group or child care centre (n=2), and
- other people in the community (not specified, n=1).

**Table 7. Who do you order these bags for?**

People for whom orders are made	Number of responses <sup>†</sup>	Percentage of respondents (%) <sup>*</sup>
<b>My household</b>	319	93.5
<b>Other family members (who do not live with me)</b>	56	16.4
<b>Friends</b>	48	14.1
<b>Other</b>	19	5.6

<sup>†</sup> 4 missing responses.

<sup>\*</sup> Respondents could choose more than one category, therefore the percentages do not sum to 100%.

As well as using the Co-op, many respondents (nearly 80%) also obtained fruit and vegetables from elsewhere (for example, the supermarket or garden). For approximately one in five respondents, the Co-op was their only source of fruit and vegetables.

**Table 8. Is the Co-op your only source of fruit and vegetables?**

Source of fruit and vegetables	Number of responses <sup>*</sup>	Percentage of respondents (%)
<b>Yes, I get all of my fruit and vegetables from the Co-op</b>	72	20.9
<b>No, I always also get fruit and vegetables from elsewhere</b>	125	36.5
<b>Sometimes. I also get fruit and vegetables from elsewhere</b>	146	42.6

<sup>\*</sup> 3 missing responses.

## Use of recipe cards and health information

Three quarters of respondents (74.5%) used the recipe cards provided in the bags ‘often’ or ‘sometimes’. Of those respondents that said that they did not use the recipe cards, 53 provided a reason. These included:

- being a confident cook (n=18)
- preferring to use their own recipes and/or having a usual repertoire of meals (n=14)
- being too busy (n=6)
- not being confident enough to try, the recipe being too complicated, not liking cooking, or describing themselves as “too lazy” (n=5)
- recipes not appealing (n=5)

- preferring to cook simple food (n=3)
- recipes being for meals that are too large for one person (n=2)
- having fussy eaters in the household (n=2)
- recipes perceived to be unhealthy (n=1)
- recipes not being large or inexpensive enough (n=1)
- recipes not appropriate for a vegan diet (n=1), and
- forgetting to keep them (n=1).

Three respondents mentioned that even though they did not use the recipe cards, they liked to read them, keep them for future reference, and/or give them away to family members. One respondent also stated that they found the tips on the recipe cards very useful. It was suggested that a photograph of the meal may be helpful, and that sometimes the recipes were for vegetables that were not included in the bag.

**Table 9. Do you use the recipes provided?**

Recipe use	Number of responses*	Percentage of respondents (%)
<b>Yes, often</b>	54	16.0
<b>Yes, sometimes</b>	197	58.5
<b>No, never</b>	86	25.5

\* 8 missing responses.

The majority of respondents (85.1%) read the health information on the back of the recipe card “often” or “sometimes”.

**Table 10. Do you read the health information on the back of the recipe cards?**

Reads health information	Number of responses*	Percentage of respondents (%)
<b>Yes, often</b>	133	40.3
<b>Yes, sometimes</b>	148	44.8
<b>No, never</b>	49	14.8

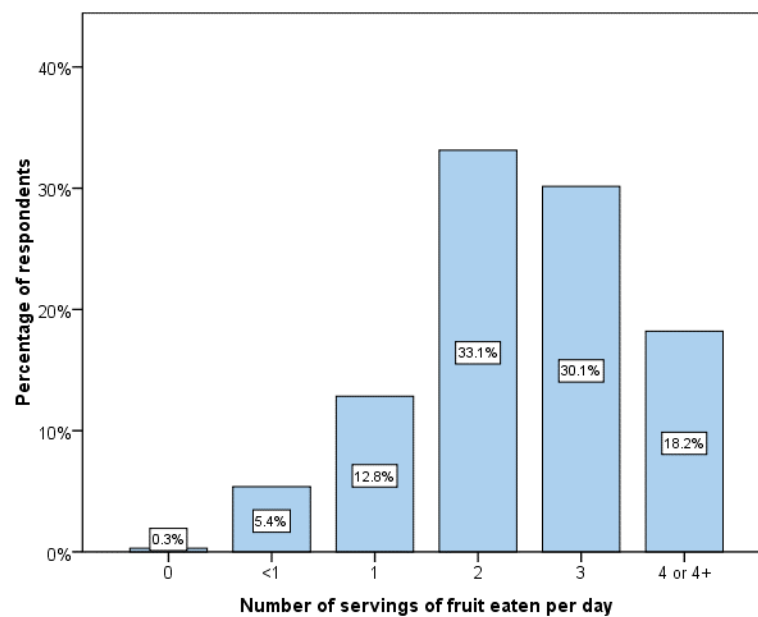
\* 15 missing responses.

## Usual fruit and vegetable intake

### Fruit intake

Most respondents reported eating two or three servings of fruit every day, and fewer than 6% of respondents reported that they ate less than one serving of fruit every day (Figure 7). The New Zealand Ministry of Health recommends that adults consume at least two servings of fruit every day (Ministry of Health, 2003), and over 80% of respondents met this recommendation.

**Figure 7. On average, how many servings of fruit (fresh, frozen, canned or stewed) do you eat per day?**



Slightly fewer Māori (75.0%) than non-Māori (82.3%) respondents reported eating two or more servings of fruit per day, however this difference was not statistically significant ( $p=0.26$ ).

**Table 11. Respondents who reported eating two or more servings of fruit per day, by ethnic group\***

Ethnic group	Eats $\geq 2$ servings of fruit per day % (n)	Does not eat $\geq 2$ servings of fruit per day % (n)
<b>Māori</b>	75.0 (30)	25.0 (10)
<b>Non-Māori</b>	82.3 (242)	17.7 (52)

\* Presented as: Percentage of respondents within each ethnic group (number of respondents).

Similar proportions of respondents meeting the recommended guidelines for fruit intake were found between those who had been using the Co-op for more than 12 months (80.9%) and those who had been using the Co-op for 12 months or fewer (82.4%,  $p=0.72$ ).

**Table 12. Respondents who reported eating two or more servings of fruit per day, by duration of Co-op use\***

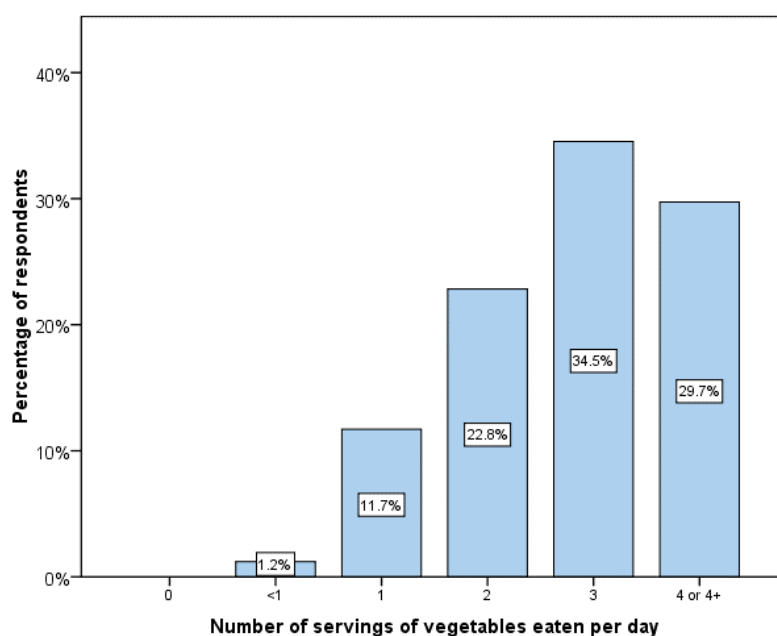
Duration of Co-op use	Eats $\geq 2$ servings of fruit per day % (n)	Does not eat $\geq 2$ servings of fruit per day % (n)
<b><math>\leq 12</math> months</b>	82.4 (164)	17.6 (35)
<b><math>&gt;12</math> months</b>	80.9 (110)	19.1 (26)

\* Presented as: Percentage of respondents within each duration group (number of respondents).

## Vegetable intake

Thirteen percent of respondents reported they ate one serving of vegetables per day or fewer (Figure 8). The New Zealand Ministry of Health recommends that adults consume at least three servings of vegetables every day (Ministry of Health, 2003), and nearly two thirds of respondents (64.2%) met this recommendation.

**Figure 8. On average, how many servings of vegetables (fresh, frozen, canned or stewed) do you eat per day?**



Fewer Māori (57.5%) than non-Māori (65.2%) respondents reported eating three or more servings of vegetables per day, however this difference was not statistically significant ( $p=0.34$ ).

**Table 13. Respondents who reported eating three or more servings of vegetables per day, by ethnic group\***

Ethnic group	Eats $\geq 3$ servings of vegetables per day % (n)	Does not eat $\geq 3$ servings of vegetables per day % (n)
<b>Māori</b>	57.5 (23)	42.5 (17)
<b>Non-Māori</b>	65.2 (191)	34.8 (102)

\* Presented as: Percentage of respondents within each ethnic group (number of respondents).

Significantly more respondents who had been using the Co-op for more than 12 months reported meeting the guidelines for vegetable consumption (71.6%) than those who had been using the Co-op for 12 months or fewer (59.3%,  $p=0.02$ ).



**Table 14. Respondents who reported eating three or more servings of vegetables per day, by duration of Co-op use\***

Duration of Co-op use	Eats ≥3 servings of vegetables per day % (n)	Does not eat ≥3 servings of vegetables per day % (n)
≤12 months	59.3 (118)	40.7 (81)
>12 months	71.6 (96)	28.4 (38)

\* Presented as: Percentage of respondents within each duration group (number of respondents).

## Changes that have occurred since members began using the Co-op

Almost three quarters of respondents (73.3%) reported that they had eaten more fruit and vegetables since they began using the Co-op, while about one fifth (19.4%) had not. Eight percent of respondents were not sure.

**Table 15. Have you eaten more fruit and vegetables since you began using the Co-op?**

Eaten more fruit and vegetables	Number of responses*	Percentage of respondents (%)
Yes	244	73.3
No	64	19.2
I'm not sure	25	7.5

\* 12 missing responses.

Over four fifths of respondents had tried new varieties of fruit and vegetables since they began using the Co-op.

**Table 16. Have you tried new varieties of fruit and vegetables since you began using the Co-op?**

Tried new varieties of fruit and vegetables	Number of responses*	Percentage of respondents (%)
Yes	272	81.7
No	52	15.6
I'm not sure	9	2.7

\* 12 missing responses.

One in every five respondents had become a volunteer of the Co-op since becoming a member. Over one quarter of respondents stated that they enjoyed living in their neighbourhood more than before they began using the Co-op, and a further one third reported that no changes had occurred. Eighty-five respondents listed other changes that had occurred as a result of using the Co-op. These have been grouped into four broad areas, and encompassed:

- Social and community aspects, including more contact with other people in the local community, meeting new people, getting involved in the community, becoming a volunteer, and sharing excess fruit and vegetables with others (n=29).

- Health and behavioural aspects, such as improved eating habits, cooking practices, health, and/or lifestyle behaviours (n=27).
- Economic aspects, such as saving money (n=9).
- Operational aspects (i.e. relating to the running of the Co-op itself), such as changes in leadership, venue, and numbers of people involved (n=7).
- Unclear or general comments (n=13).

**Table 17. Have any changes occurred since you began using the Co-op?**

Changes	Number of responses <sup>†</sup>	Percentage of respondents (%) <sup>*</sup>
<b>I am a volunteer with the Co-op</b>	65	20.6
<b>I enjoy living in my neighbourhood more than before</b>	85	26.9
<b>Other</b>	85	26.9
<b>None</b>	116	36.7

<sup>†</sup> 29 missing responses.

<sup>\*</sup> Respondents could choose more than one change, therefore the percentages do not sum to 100%.

## Indicators of food security

In the past 12 months, over one quarter of respondents had personally gone without fresh fruit and vegetables often so they could pay for other things they needed.

**Table 18. In the last 12 months have you personally gone without fresh fruit and vegetables, often, so that you could pay for other things you needed?**

Gone without fresh fruit and vegetables often	Number of responses <sup>*</sup>	Percentage of respondents (%)
<b>Yes</b>	94	28.3
<b>No</b>	238	71.7

<sup>\*</sup> 13 missing responses.

Significantly more respondents who reported going without fresh fruit and vegetables often (28.3%) stated that the Co-op was their only source of fruit and vegetables compared to those who reported not going without (17.6%,  $p=0.03$ ).

**Table 19. Respondents who reported that the Co-op was their only source of fruit and vegetables, according to whether they have personally gone without fresh fruit and vegetables, often, so that they could pay for other things they needed\***

Gone without fresh fruit and vegetables often	Co-op is the only source of fruit and vegetables % (n)	Co-op is not the only source of fruit and vegetables % (n)
<b>Yes</b>	28.3 (26)	71.7 (66)
<b>No</b>	17.6 (42)	82.4 (196)

\* Presented as: Percentage of respondents within each yes/no group (number of respondents).

Three percent of respondents often relied on others to provide food and/or money for food, and 23% sometimes relied on others.

**Table 20. Do you rely on others to provide food and/or money for food, for your household, when you don't have enough money?**

Frequency	Number of responses*	Percentage of respondents (%)
<b>Often</b>	10	3.0
<b>Sometimes</b>	77	22.6
<b>Never</b>	249	73.2
<b>Don't know</b>	4	1.2

\* 5 missing responses.

Significantly more respondents who reported often or sometimes relying on others to provide food and/or money for food (30.2%) stated that the Co-op was their only source of fruit and vegetables compared to those who reported never relying on others (17.7%,  $p=0.01$ ).

**Table 21. Respondents who reported that the Co-op was their only source of fruit and vegetables, according to how often they rely on others to provide food and/or money for food, for their household, when they don't have enough money**

Frequency <sup>†</sup>	Co-op is the only source of fruit and vegetables % (n)	Co-op is not the only source of fruit and vegetables % (n)
<b>Often or sometimes</b>	30.2 (26)	69.8 (60)
<b>Never</b>	17.7 (44)	82.3 (204)

\* Presented as: Percentage of respondents within each frequency group (number of respondents).

<sup>†</sup> Respondents who answered 'Don't know' were excluded from the analysis.

## Additional comments regarding the Co-op

Respondents were asked to provide any further comments about the Co-op, and 176 respondents did so. The greatest majority of comments was positive, and addressed several topics.

Many respondents commented that the Co-op provided a “great” community service, and was well-organised. The “valuable” and “worthwhile” nature of the service helping local people gain access to low-priced, healthy produce was often mentioned. It was regarded as an asset to the community, and respondents wanted to support this positive project, and expressed a desire to see it continue and expand.

*“Fantastic project, supporting so many people that need cheaper, healthy food options. Keep up the great work.”*

*“Fabulous service!! I have referred heaps of people.”*

A great deal of gratitude was expressed – both for the Co-op service itself, and the committed work of the “friendly”, “helpful” and “welcoming” volunteers. Respondents stated that they enjoyed being part of the Co-op, and the appreciated the positive social aspects it provided (such as meeting others, and sharing food/recipes).

*“It is an excellent service. Welcoming people and I so appreciate the volunteers that give their time so freely. They do a massive job bagging all those vege & fruits. I have utmost respect for them.”*

*“Really appreciate the Co-op and all the volunteers. Helps me so much to provide well for my family.”*

*“... a great way to connect with the community.”*

*“Everyone I know participates and we get to share recipes and/or swap fruit/veg.”*

The reasonable price of the produce at the Co-op was mentioned, and that the service provided “great value for money”. It was believed to be more economical to use the Co-op than purchase fresh fruit and vegetables at the supermarket. Benefits to household budgeting and food security were reported, including saving money, the use of a pre-paid system ensuring a supply of fresh produce, and the redistribution of savings from using the Co-op (e.g. some of the money that would usually be spent on produce could now be spent on other necessities, such as other food or bills).

*“Your groceries come to an end but if you pre-purchase your pack, you know you’ve got fruit and vege.”*

*“It is fantastic I am able to afford good healthy food and have more money to spend on quality food rather than cheap and nasty.”*

*“Without the Co-op I would not have fruit or veges.”*

The quality and variety of the produce was appreciated by respondents. Some mentioned being able to try new types of fruit and vegetables that they may not have otherwise bought themselves, due to either unfamiliarity or price. Many respondents looked forward to receiving their order each week and noted the “excitement” of finding out what the bag contained. Respondents shared excess or not well-liked produce with wider family members and neighbours.

*“Nice surprise to discover what is in this week’s fruit & vege pack.”*

*"It is nice to give away veges you don't like or buy an extra bag as a gift."*

*"Really good variety most weeks. Good to try other fruits etc that I don't buy usually because of the price."*

*"I love the Co-op. I always look forward to Wednesday fresh fruit and vege day. I can make much better meals now. I share around my neighbours what we cannot use or don't especially like ourselves. Everyone is happy. A wonderful concept. Thank you to all the volunteers - for a sterling job."*

Some respondents commented on the positive influence that that being part of the Co-op had on their lifestyle (and sometimes their wider family). These included improved cooking skills, healthier eating practices overall, eating more fruit and vegetables, and eating a wider variety of fruit and vegetables.

*"I have found I am eating more healthy. I couldn't do without your help. Thank you."*

*"It is fantastic, my kids eat a wider range of fruit and veges."*

Eight respondents highlighted concerns about the quality of the fruit and vegetables included in the packs, stating that sometimes the produce was bruised/squashed, overripe, or too many of the same item were included. One respondent commented that they were considering discontinuing their membership with the Co-op due to this issue.

Some respondents provided suggestions for the Co-op, including:

- using only New Zealand-grown produce
- providing recipes suitable for one-person households
- having a vegetable-only option, or having a greater amount of vegetables than fruit
- including information on where else in Christchurch people can join the Co-op (e.g. by using a Facebook group or writing it on the recipe/health information cards)
- using alternatives to plastic bags (such as swappable boxes)
- implementing a programme where members can donate a bag of produce to others who need it, and
- ensuring that communications are consistent to avoid confusion (e.g. members all being given the same information, and not different information from different people).

## Discussion

This evaluation provides novel data on the utilisation and effects of a community-based fruit and vegetable co-op, and the characteristics and views of the people who use it.

### Characteristics of respondents

The survey revealed that a wide variety of people in the community use the Co-op. Members mostly lived in households of 2-5 people, and one fifth lived in neighbourhoods with the highest deprivation scores (i.e. NZDep2013 deciles 9 and 10).

Respondents were predominantly European, with small proportions identifying as Māori or Pacific. Compared to population count data from the 2013 New Zealand Census (Statistics New Zealand, 2014), the percentage of people identifying as European and Māori in the survey sample appears to be slightly higher than is in Christchurch city (Table 22). It is positive to see that the proportion of Māori people using the Co-op is at least as high as is in the Christchurch population (though it is important to note that the sample size of 41 is small). The proportion of respondents identifying as Pacific seems similar to that in Christchurch city, however, this sample size is again very small. A much lower proportion of survey respondents were Asian than is the case in Christchurch city. This may be due to a number of factors, including fewer people of Asian ethnicity living in neighbourhoods near Co-op hubs, the communication strategies used, or food/purchasing preferences.

**Table 22. Ethnicity of Co-op survey respondents compared with the national and Christchurch city population**

Ethnic group*	Percentage (%)		
	NZ <sup>†</sup>	Christchurch <sup>†</sup>	Co-op survey respondents
European	74.0	83.9	92.4
Māori	14.9	8.5	12.1
Pacific	7.4	3.1	3.5
Asian	11.8	9.4	1.5
Middle Eastern/Latin American/African	1.2	1.0	1.2
Other <sup>§</sup>	1.7	1.9	1.8

\* People who reported more than one ethnic group are counted once in each group reported. This means that the total number of responses for all ethnic groups can be greater than the total number of people who stated their ethnicities.

<sup>†</sup> Christchurch city and New Zealand data sourced from the 2013 New Zealand Census (Statistics New Zealand, 2014) .

<sup>§</sup> Includes respondents who stated that their ethnicity was “New Zealander”, “Kiwi” or “Pākehā”, as well as other ethnicities not included in the above five categories.

Both younger ( $\leq 24$  years) and older ( $\geq 75$  years) age groups appear lower in the survey sample compared to Christchurch city (Statistics New Zealand, 2014). This could be due to factors such as



living arrangements or differing food purchasing habits, which may mean that using the Co-op is a less viable option for people in these age groups.

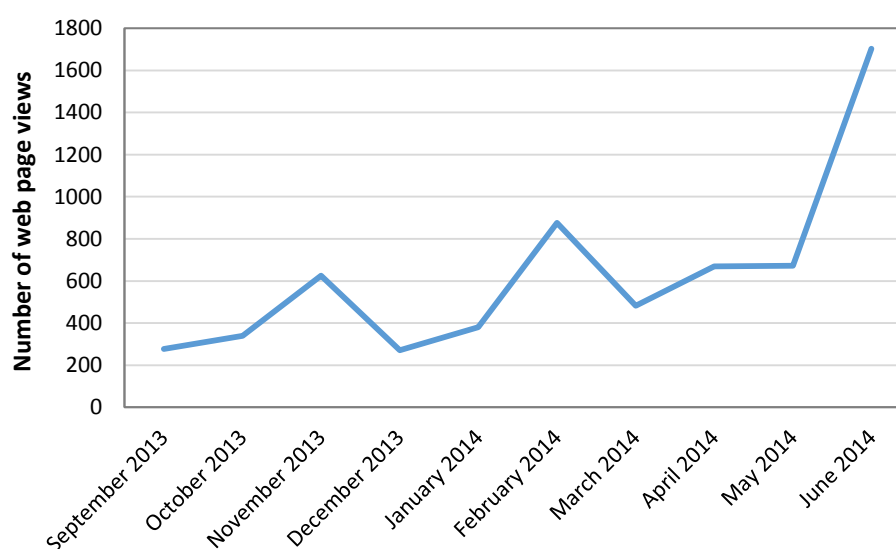
It is difficult to state definitively how representative the survey sample is of the wider population of Co-op members given the limitations of conducting this type of survey (see Limitations section). However, as 18 of the 40 distribution hubs were surveyed, and the response rate within those hubs was relatively good (67.5%), these data may provide a reasonable estimate of survey members.

## Respondents' use of the Co-op

The social and community-focussed nature of the Co-op is illustrated by the ways most people came to hear about joining: word of mouth (in particular, friends and family), church, and community groups/resources. It is encouraging to note that organisations that work with families and those in need of assistance (e.g. budget advisory services, schools), are also recommending the Co-op. These personal, and often informal, networks are likely to have been a factor in the rapid growth of the Co-op. The expansion of the Co-op to accommodate many new members and hubs suggests the need for Co-op collaborators to consider the potential for the Co-op to further increase in size and plan for the long-term sustainability of the project.

Over the past 10 months, the Fruit & Vegetable Co-op page of the CPH website<sup>5</sup> has consistently been the most viewed page, and the number of views each month has increased substantially (Figure 9). This shows that many people are using the CPH website to learn more about the Co-op, highlighting both the interest in the service, and the need for the information to be kept up-to-date and relevant.

**Figure 9. Number of Fruit and Vegetable Co-op web page views per month**



<sup>5</sup> <http://www.cph.co.nz/About-Us/Fruit-and-Vege-Cooperative/>

Most respondents had been using the Co-op for several months. While many respondents ordered one pack each time, almost one third bought two or more. Most obviously, larger families would require a larger quantity of produce, but survey findings highlighted that over one third of respondents bought packs for people who do not live in their household (e.g. wider family, and friends). This highlights a recurring theme of generosity that was noted in the survey responses, where some people mentioned gifting packs to others or sharing their contents with whānau and neighbours.

For most people, the Co-op was not their only source of fruit and vegetables. Although the packs contain a variety of fruit and vegetables, they may not comprise a full complement of items to be able to prepare all meals for the week. Therefore, many respondents reported supplementing their order with produce from elsewhere (e.g. the supermarket, or their garden). However, for one in five respondents, the Co-op was their only source of fresh produce.

The Co-op provides a unique opportunity for CPH to provide healthy recipes and general health information to a wider audience. Many people reported using the recipes and reading the health information provided in the packs sometimes or often. On further investigation into the reasons why one quarter of respondents did not use the recipes, more than half were already confident preparing meals with the produce in the packs and/or preferred to use their own recipes. Others felt that the recipes were not appropriate or appealing for their whānau. There was a small sub-group of respondents who reported experiencing barriers to using the recipes. These included those who were not confident in their cooking skills, were too busy to try new recipes, or the meals produced were too large (for one person). The recipe and health information cards provide an opportunity for CPH to recommend food skills-based programmes, such as Senior Chef<sup>6</sup>.

## Effects of Co-op participation

### Fruit and vegetable consumption

By providing fruit and vegetables at a lower price, that the Co-op has the potential to increase fruit and vegetable intake and be pro-equity.

The main motivations identified for using the Co-op – price and health, are both factors that have been found to be associated with food purchasing and consumption practices in other research studies (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Ni Mhurchu et al., 2012; Pollard, Kirk, & Cade, 2002).

### *The impact of price on fruit and vegetable purchase and consumption*

Most of the respondents used the Co-op to save money, and a small number of people mentioned economic benefits as a result of joining the Co-op.

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<sup>6</sup> <http://www.seniorchef.co.nz/>

The Co-op provides fresh produce at a price that tends to be lower than would be available in most retail outlets in Christchurch, and the reasonable price appeared to be greatly appreciated by members. It has been suggested using statistical modelling techniques that price incentives/subsidies could modify food purchasing behaviour, and positively influence population health (Andreyeva, Long, & Brownell, 2010; Eyles, Ni Mhurchu, Nghiem, & Blakely, 2012). Furthermore, as low-income and Māori households may be most sensitive to changes in food prices, they may receive the greatest benefit (Ni Mhurchu et al., 2013). For example, in New Zealand a 10% subsidy on fruit could lead to a 6.5% increase in purchases overall, and a 10% subsidy on vegetables could lead to an 11% increase in consumption among people in the lowest income quintile (Ni Mhurchu, et al., 2013).

The hypothesis that price discounts on healthy food items could lead to a change in behaviour was supported in a large randomised controlled trial conducted in eight New Zealand supermarkets (Ni Mhurchu, Blakely, Jiang, Eyles, & Rodgers, 2010). Groups receiving price discounts on healthy foods purchased significantly more fruit and vegetables ( $\approx 0.5$  kg per week per participant) over the 6-month intervention.

Using price incentives to increase the purchase and consumption of healthy foods (in particular fruit and vegetables) is viewed positively by New Zealander shoppers (Ni Mhurchu, et al., 2012), and this is confirmed by the growing membership and support that the Co-op is experiencing.

As well as price, household income has an influence on fruit and vegetable intake, and international evidence indicates that those with low income and/or experiencing food insecurity report lower fruit and vegetable consumption (Diez-Roux et al., 1999; Kamphuis et al., 2006; Metcalf, Scragg, & Jackson, 2014; Pollard, et al., 2002).

In the current survey, the percentage of respondents reporting that they relied on others to provide food and/or money for food for their household often or sometimes (25.6%) was higher than that reported in the 2008/2009 Adult National Nutrition Survey (8.8%) (University of Otago & Ministry of Health, 2011). In addition, over one quarter of respondents reported that they have gone without fresh produce often so that they could pay for other things that they needed. This figure is higher than the 14.8% reported in a large New Zealand-wide longitudinal survey of 18,950 adults in 2004/2005 (K. N. Carter, Lanumata, Kruse, & Gorton, 2010).

Although a full assessment of food security was not conducted in the current survey, these findings may indicate that the Co-op is catering to a number of people who may be at risk of food insecurity. Interestingly, those at risk of food insecurity were more likely to use the Co-op as their only source of fruit and vegetables.

### *Fruit and vegetable consumption and health*

The overall goal of the Fruit & Vegetable Co-op is to increase the quantity and variety of fruit and vegetables consumed by members and their whānau.

Globally, low fruit and vegetable intake is one of the top ten risk factors for attributable mortality (World Health Organization, 2014), and it has been estimated that inadequate intake ( $<600$ g/day) contributed to approximately 6% of all deaths in New Zealand in 1997 (Tobias et al., 2006). Greater

fruit and/or vegetable consumption is associated with a lower risk of several diseases, including coronary heart disease (Dauchet, Amouyel, Hercberg, & Dallongeville, 2006; He, Nowson, Lucas, & MacGregor, 2007), stroke (Dauchet, Amouyel, & Dallongeville, 2005; He, Nowson, & MacGregor, 2006; Hu, Huang, Wang, Zhang, & Qu, 2014), type 2 diabetes (P. Carter, Gray, Troughton, Khunti, & Davies, 2010; Cooper et al., 2012), dementia and cognitive decline (Loef & Walach, 2012), and some cancers, including: colorectal (Aune et al., 2011; Bradbury, Appleby, & Key, 2014), breast (Gandini, Merzenich, Robertson, & Boyle, 2000), gastric (Lunet et al., 2007; Wang et al., 2014), oral (Bradbury, et al., 2014; Pavia, Pileggi, Nobile, & Angelillo, 2006), and oesophageal (Bradbury, et al., 2014; Li et al., 2014; Liu, Wang, Leng, & Lv, 2013).

It has been estimated that even a relatively small increase in fruit and vegetable consumption could have a significant impact on preventing non-communicable diseases and improving population health (Lock, Pomerleau, Causer, Altmann, & McKee, 2005; Tobias, et al., 2006). Many respondents reported eating a greater amount and variety of fruit and vegetables since joining the Co-op. Keeping in mind the tendency for people to over-report fruit and vegetable consumption in surveys (Agudo, 2005), this is still an encouraging finding. This reported increase in fruit and vegetable consumption supports research that having fruit and vegetables readily available at home is a facilitating factor for higher fruit and vegetable intake (Ding et al., 2012; Jago, Baranowski, & Baranowski, 2007; Rasmussen et al., 2006).

The New Zealand Ministry of Health recommends that children, young people and adults consume at least two servings of fruit and at least three servings of vegetables every day (Ministry of Health, 2003, 2012a). Compared with unadjusted data from the 2011/2012 and 2012/2013 New Zealand Health Surveys (Ministry of Health, 2014), it appears that more Co-op members reported meeting the recommended guidelines for fruit intake (81.4%) than in the Canterbury District Health Board area (61.8%) and New Zealand (58.3%). Conversely, fewer Co-op members reported meeting the recommended guidelines for vegetable intake (64.2%) than has been reported in the Canterbury District Health Board area (82.4%) and New Zealand (67.3%).

Fruit and vegetable consumption patterns in New Zealand have been shown to differ by ethnicity and level of deprivation. In the 2011/2012 New Zealand Health Survey, Māori adults (aged ≥15 years) were significantly less likely than non-Māori adults to meet the recommended guidelines for fruit intake (≥2 servings per day) (Ministry of Health, 2012b). Pacific and Asian adults were significantly less likely than non-Pacific and non-Asian adults (respectively) to meet the recommended guidelines for vegetable intake (≥3 servings per day) (Ministry of Health, 2012b). In the current survey, there was no significant difference between the percentage of Māori and non-Māori respondents meeting the recommended guidelines for fruit and vegetable intake.

In the same survey (2011/2012 New Zealand Health Survey), adults living in areas with the highest deprivation scores (NZDep2006 deciles 9-10) were significantly less likely to meet the recommended daily guidelines for vegetable or fruit intake than adults in areas with the lowest deprivation scores (deciles 1-2) (Ministry of Health, 2012b). Similarly, in a national survey of 2,503 children and young people (aged 5-24 years), those living in areas with high deprivation scores (deciles 9-10) were less likely to meet the guideline for vegetable intake than those living in other areas (deciles 1-8) (Clinical Trials Research Unit, University of Auckland, & Synovate, 2010). However, there was no significant

difference in the proportion of respondents meeting the guideline for fruit intake by level of neighbourhood deprivation.

The current survey only assessed the fruit and vegetable intake of the Co-op member arriving to pick up their order, not their children, family members, or any other people that the pack may be for. The fruit and vegetable intake of children and adolescents is influenced greatly by parental intake, availability of fruit and vegetables in the home, parental guidelines and encouragement, and eating meals together as a family (Pearson, Biddle, & Gorely, 2009; Rasmussen, et al., 2006; Utter, Scragg, Schaaf, & Ni Mhurchu, 2008). In the New Zealand survey of children and young people (aged 5-24 years) mentioned previously, only approximately 39.7% met the guideline for vegetable intake, and 68.6% met the guideline for fruit intake (Clinical Trials Research Unit, et al., 2010). If Co-op members are preparing, cooking and eating more fruit and vegetables themselves, then a potential flow-on effect would be for this positive behaviour to influence any children and wider whānau to do the same.

Overall, it appears that for many respondents, Co-op membership has had a positive impact on the reported quantity and variety of fruit and vegetables consumed. However, over a third of people still struggled to meet the recommended guidelines for vegetable intake. Interestingly, respondents who had been using the Co-op for more than a year were more likely to meet recommended guidelines for vegetable intake. This may suggest that it takes a prolonged period of repeated exposure for people to gain the confidence to prepare, cook and consume more vegetables on a daily basis.

### Social connection

The social motivations and outcomes that respondents mentioned, for example, meeting other people, and being a volunteer, are unique to the Co-op. The Co-op appears to provide an opportunity for people to meet, interact and share with others as part of a positive community-focussed project.

Neighbourhood characteristics (e.g. social cohesion and access to community resources) can influence local residents' health and health-related behaviours (Stevenson, Pearce, Blakely, Ivory, & Witten, 2009). By providing a convenient local setting for social interaction and access to healthy food, in this context the Co-op hubs could themselves be viewed as "health-promoting resources". The social, positive, convenient and accessible nature of the Co-op could be some of the reasons why one quarter of respondents reported that they enjoyed living in their neighbourhood more than before.

A relatively high number of respondents stated that they were a Co-op volunteer (54-65 people). This is likely due to the fact that at some hubs, all members must also be a volunteer with the Co-op. Another reason why the number of volunteers in the survey sample is substantial could be that Co-op volunteers were more likely to be present at the hub and agree to participate in the survey. These volunteers may experience additional benefits related to donating their time and skills to the Co-op. Many positive outcomes of being a volunteer have been reported, and volunteering regularly over time has been shown to significantly improve psychological wellbeing and self-reported health (Piliavin & Siegl, 2007). Recruiting and maintaining a large pool of volunteer personnel will be necessary for the smooth operation and long-term sustainability of the Co-op.

## Limitations

The current survey has several limitations which need to be taken into account when considering the findings.

Although all Co-op members who were at a selected hub on the survey day were asked to participate, not all did. This may have resulted in non-response bias, where those who completed the questionnaire (respondents) may have different characteristics or views to those who did not complete the questionnaire (non-respondents). For example, respondents may be more likely to use the Co-op often, have positive views on the Co-op, or be a volunteer.

Certain groups of people may be underrepresented in the current survey because they do not (or cannot) go to the hub to collect their orders. For example, people who work, study, or care for others during the day, have a disability, or do not have their own transport may get their orders picked up by others.

These two types of bias (non-response and coverage, respectively) may limit the generalisability of the survey findings to the greater Co-op membership (Barriball & While, 1999; Blair & Zinkhan, 2006). It is difficult to state definitively how representative the survey sample is of the wider population of Co-op members, however, as 18 of the 40 distribution hubs were surveyed, and the response rate within those hubs was relatively good (67.5%), these data may provide a reasonable estimate of survey members.

For practical (logistical, economic, and time) reasons, the current survey used a cluster-based sampling method which involved randomly selecting 18 of the 40 distribution hubs, and inviting all Co-op members at those hubs on a particular day to participate. This type of sample may not reflect the diversity of the population most accurately. This is because members who attend the same hub are likely to share more similarities with each other (e.g. living in the same neighbourhood, and other personal attributes), than with members from other hubs. This can result in a higher variance, particularly as the membership of each hub varied - meaning hubs with more members may have been overrepresented.

In surveys such as this with questions addressing self-reported behaviour, respondents may be more likely to provide answers that are socially desirable (e.g. over-reporting their daily intake of fruit and vegetables) (Hebert, Clemow, Pbert, Ockene, & Ockene, 1995; Hebert et al., 2008). This may occur particularly if respondents are completing the survey face-to-face with an interviewer, rather than filling in the form themselves anonymously. This social desirability bias can inflate positive outcomes, so these findings should be interpreted with caution.

Some respondents did not answer all questions (or responses were illegible/ambiguous and could not be used). For most questions, this number of missing responses was relatively small ( $\leq 15$ ), and the number of missing responses are reported with the data in the Findings section. As these missing responses were few, and did not appear to be due to a systematic failure (e.g. respondents not understanding the wording of a particular question), it is unlikely that they will significantly affect the findings.



Finally, NZDep2013 has been used as an indicator of neighbourhood socioeconomic deprivation. It is important to remember that the scores apply to geographical areas, and not individuals (Atkinson, et al., 2014). Also noteworthy is that the level of socioeconomic deprivation of individuals within a given area can vary. Therefore, this measure is used to describe the neighbourhoods in which survey respondents reside, not the respondents themselves.

## Conclusions

Through active community involvement this cross-organisational collaboration provides greater access to fresh produce at a low price to members, some of whom may otherwise struggle to afford fruit and vegetables. As a result, members report an increase in the quantity and variety of fruit and vegetables consumed. The Co-op has increased opportunities for volunteering and social interaction, and for CPH to distribute healthy cooking and general health information more widely.

This positive community-focussed model has the potential to further enhance well-being and food security in areas of high need.

## Recommendations

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Based on the findings of this evaluation, it is recommended that the Communities Team continue to:

- Support the Fruit and Vegetable Co-op and provide recipe cards and health information for inclusion in the packs. The team might also consider providing recipes with options for vegetarians or one-person households, and recommend food skills-based programmes (such as Senior Chef).
- Maintain the information on the Co-op page of the CPH website regularly, as well as provide updated material to those managing any other related sites (e.g. Facebook groups).
- Work with Co-op collaborators to:
  - inform specific community groups and services (e.g. budget advisory services, Marae, migrant and refugee services, churches), and larger organisations (e.g. WINZ, Plunket) of the Co-op and encourage them to refer people from high-need population groups (e.g. those on low income, living in areas of higher deprivation, Māori or Pacific, young families, older people)
  - develop strategies to increase vegetable consumption by Co-op members, especially new Co-op members, and
  - develop a long-term plan to ensure the viability and sustainability of the project, including recruiting and maintaining a large pool of volunteer personnel.
- Consider working with the Information Team to develop a long-term evaluation plan to collect data at regular intervals.

## Appendix 1: Questionnaire

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## Fruit and Vegetable Co-op Survey

We would like to know more about the people who use the Co-op so we can plan for the future.  
Please help us by completing these brief questions. Your responses are confidential.

**1. Where did you hear about the Co-op?** *(Tick all that apply to you)*

- ☐ Community & Public Health website    ☐ Facebook    ☐ Friends or family  
☐ Newspaper    ☐ My church    ☐ Other *(Please specify)* \_\_\_\_\_

**2. How long have you been using the Co-op?**

- ☐ Less than 3 months    ☐ 4 - 12 months    ☐ More than 12 months

**3. Why do you use the Co-op?** *(Tick all that apply to you)*

- ☐ It helps my family to eat more healthily    ☐ To save money  
☐ To save time shopping    ☐ It is close to where I live/work  
☐ I like meeting other people and socialising    ☐ I am a volunteer as well as a customer  
☐ Other *(Please specify)* \_\_\_\_\_

**4. How many order(s) do you order each time?**

- ☐ One order    ☐ Two orders    ☐ Three or more orders

**5. Who do you order these bags for?** *(Tick all that apply to you)*

- ☐ My household    ☐ Other family members (who do not live with me)  
☐ Friends    ☐ Others *(Please specify)* \_\_\_\_\_

**6. Is the Co-op your only source of fruit and vegetables?**

- ☐ Yes, I get all of my fruit and vegetables from the Co-op  
☐ No, I always also get fruit and vegetables from elsewhere (for example, the supermarket or garden)  
☐ Sometimes. I also get fruit and vegetables from elsewhere (for example, the supermarket or garden) occasionally

**7. Do you use the recipes provided?**

- ☐ Yes, often    ☐ Yes, sometimes    ☐ No, never

**7a. If you do not use the recipes, can you tell us why not?** *(For example, you are a confident cook, recipes are too complicated for you)*

**8. Do you read the health information on the back of the recipe cards?**

- ☐ Yes, often                      ☐ Yes, sometimes                      ☐ No, never

**9. On average, how many servings of fruit (fresh, frozen, canned or stewed) do you eat per day? (Tick one box only)**

*Please do not include fruit juice or dried fruit. A 'serving' = 1 medium piece or 2 small pieces of fruit or ½ cup of stewed fruit. For example, 1 apple and 2 small apricots = 2 servings.*

- ☐ I do not eat fruit                      ☐ 2 servings per day  
☐ Less than 1 serving a day                      ☐ 3 servings per day  
☐ 1 serving per day                      ☐ 4 or more servings per day

**10. On average, how many servings of vegetables (fresh, frozen, canned or stewed) do you eat per day? (Tick one box only)**

*Please do not include vegetable juices. A 'serving' = 1 medium potato/kumara or 1/2 cup cooked vegetables or 1 cup of salad vegetables. For example, 2 medium potatoes + ½ cups of pea = 3 servings.*

- ☐ I do not eat vegetables                      ☐ 2 servings per day  
☐ Less than 1 serving a day                      ☐ 3 servings per day  
☐ 1 serving per day                      ☐ 4 or more servings per day

**11. Have you eaten more fruit and vegetables since you began using the Co-op?**

- ☐ Yes                      ☐ No                      ☐ I'm not sure

**12. Have you tried new varieties of fruit and vegetables since you began using the Co-op?**

- ☐ Yes                      ☐ No                      ☐ I'm not sure

**13. Have any changes occurred since you began using the Co-op? (Tick all that apply to you)**

- ☐ I am a volunteer with the Co-op  
☐ I enjoy living in my neighbourhood more than before  
☐ Other (Please specify) \_\_\_\_\_  
☐ None

**14. In the last 12 months have you personally gone without fresh fruit and vegetables, often, so that you could pay for other things you needed?**

- ☐ Yes                      ☐ No



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