A Cost-Benefit Analysis of the EON Thriving Communities Program

24 June 2024

Innovation Unit

EON Foundation

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About this project

The EON Foundation delivers a nutrition-focused, healthy lifestyle and disease prevention program called Thriving Communities across communities in the NT and WA. Through regular presence over a sustained period, EON builds up trust and strong relationships. Wherever possible, EON employs local Community Assistants to work alongside the Project Manager and Provide training and local employment to to build community capacity and ensure long-term outcomes.

EON approached Innovation Unit (IU) to help them build their knowledge around the program's impacts, specifically to better understand the longer-term impacts of the program on health and wellbeing, and what an approach to quantifying these benefits could look like.

Method

In order to respond to this request, IU collected information through:

- A literature review
- Analysis and modelling using a range of available data sets
- Targeted interviews with program staff
- Additional interviews with community members (carried out by program staff)
- Creation of a bespoke CBA model to calculate costs and savings.

Approach

From the research and consultation conducted for this project, diabetes emerged as a clear and useful potential indicator of community health, as:

- Nutrition is strongly linked to Type 2 diabetes;
- Diabetes rates are high among Aboriginal people, including young Aboriginal people - with rates in remote Aboriginal communities particularly high
- Diabetes is associated with significant impacts on health and wellbeing for individuals. It also has significant costs for treatment and management for the health system;
- These costs have been quantified and documented in existing literature; and
- There are existing studies showing that school gardens can reduce diabetes.

IU was able to access data on diabetes at community-level for the NT only. As such, the findings here only relate to NT communities.

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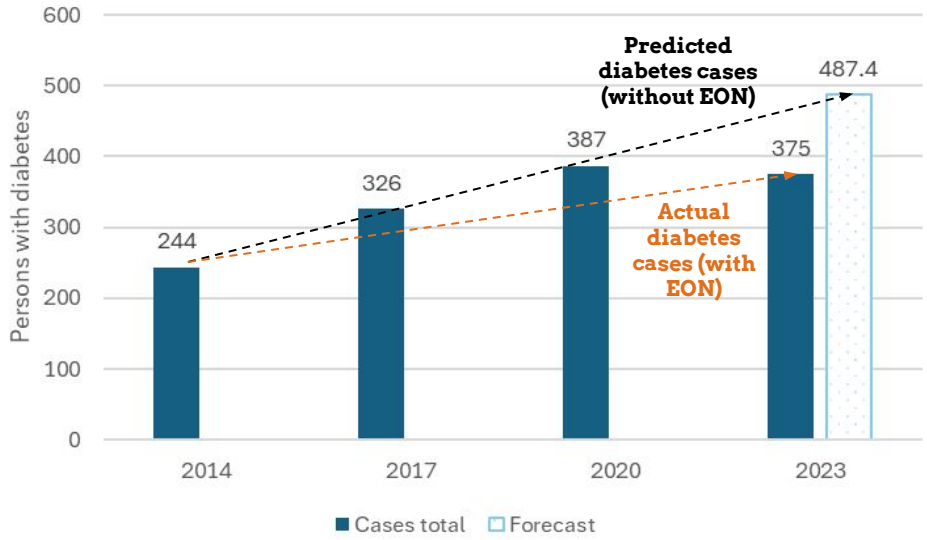
Findings

In the six NT sites where the Thriving Communities program has been implemented fully, the rates of diabetes are lower than would have been predicted or expected. Data suggest that:

- The prevalence of diabetes declined in four of six EON communities in the NT with Thriving Communities.
- Overall, the expected numbers of people with diabetes are some 112 lower than would have been expected without the program (in a population of 3,128)

Below: Persons with diabetes across six communities between 2014 and 2023 - actual and 2023 modelled scenario forecast (without EON).



Source: Calculations by Innovation Unit

In addition, the program is generating jobs for Aboriginal people in local communities, with 51% of former EON community assistants having gone on to maintain employment.

CBA outcomes

The costs and benefits of the program across the six NT EON sites considered here are assessed as follows:

CBA Domain		Total costs/ benefits (sum of years 0-4)	Total costs/ benefits (Year 5 and onwards)
Program costs		$2,870,329	$244,000
Program benefits* - total		$3,172,258	$1,575,765
*Program benefits - breakdown	Health treatment saving	$561,374	$284,447
	Improved quality of life	$2,391,641	$1,211,837
	Employment benefits	$219,252	$79,482

- This suggests a positive overall benefit over 5 years of $3.1m in benefit compared to $2.9m in costs, including a component valuing the improved quality of life.
- In Year 4, there would be a net (of program costs) program benefit of around $950k per year across these six communities.
- In Years 5 and beyond, assuming no other changes, program benefits continue while program costs decrease to around $244k, increasing net program benefits in the six sites to ~$1.3m pa.

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Additional benefits not included here

There are myriad benefits to good health and wellbeing that have not been included here, the vast majority of which transcend monetary value, such as:

- Children enjoying and attending school more
- Communities benefiting from a host of health and wellbeing benefits from less infections (ear, eye, skin), vitamin deficiencies
- People being able to die on country, rather than in dialysis units
- People being fully part of their community and its social, economic and cultural life.

These are not included in this study's scope, as they are documented elsewhere. However, the benefits seen in the proxy measure chosen (diabetes) would be correlated with the above types of impacts as well. For this reason, the actual benefits of the program are far greater than captured here.

The most significant exclusion here is the 'ripple' effect of good diet and nutrition across the community. To the extent that healthier nutrition sets up a 'virtuous circle' of continued improvement, we could see the program's impact magnified over time.

Longer-term studies would be necessary to know the extent to which program benefits are maintained or potentially expanded, and the best ways to ensure program impact continues.

"You can visually see an impact on people's health."

- EON Program Manager

Conclusion

Diabetes causes untold damage to Aboriginal people and communities. In some places, communities simply normalise the expectation that diagnosis of and treatment for diabetes is an inevitable part of life.

The analysis presented here suggests that, with the support of a program such as EON's Thriving Communities, Aboriginal communities can turn high rates of diabetes around. This means more Aboriginal people living longer, healthier lives and communities being freer of the personal and financial burdens of long-term disease.

It also means less expenditure for governments on health and welfare costs.

Project Background

Project background

Improved food security in remote communities is associated with a host of health and wellbeing outcomes.

Safe and consistent access to nutritious food in early years is vital for success in later life. In remote Aboriginal communities across Australia, sustainable food practices have been disrupted by colonial systems and replaced with supply chains that span extreme distances, promoting dietary behaviours that are expensive and nutritionally insufficient. Further, a dependency on costly freight from capital cities is at odds with goals of increased community autonomy.

Food insecurity in remote communities can be extreme. Inconsistent household income combined with competing family stressors, high prices, limited supply in local stores, and low food literacy lead to a highly unstable nutritional intake. These factors together mean that for young people growing up in remote Aboriginal communities, access to food of any kind can be tumultuous.

"It's hard when there's no good [healthy] food at the shop. We have to go to Mataranka to get it."

- Community member

Hunger impacts mood and behaviour, prevents meaningful school engagement, and causes developmental delays. We also know that there are established links between poor nutrition and broad health and wellbeing outcomes, including numerous preventable and chronic diseases.

"When it gets crowded in one household, you can't afford to feed everyone."

- *Community member*

Project background

Thriving Communities builds strong, sustained relationships with communities as they grow their capacity to improve nutrition and health.

EON Foundation recognises that a system in which children are hungry and at risk of preventable chronic diseases is unacceptable. More than this, the Foundation recognises that the path to thriving communities with strong local leadership requires practical solutions and sustained change.

The Thriving Communities program sits at the heart of EON's vision to make a lasting contribution in regional communities through the reduction of preventable and chronic disease caused by poor nutrition. It is a practical, grass-roots gardening, healthy eating and cooking, and nutrition education program based around developing large, edible gardens in remote schools and communities.

The program is delivered by EON's Project Managers who visit their communities fortnightly for up to five years. Through regular presence over a sustained period, EON builds up trust and strong relationships. Wherever possible, EON employs local Community Assistants to work alongside the Project Manager and Provide training and local employment to to build community capacity and ensure long-term outcomes.

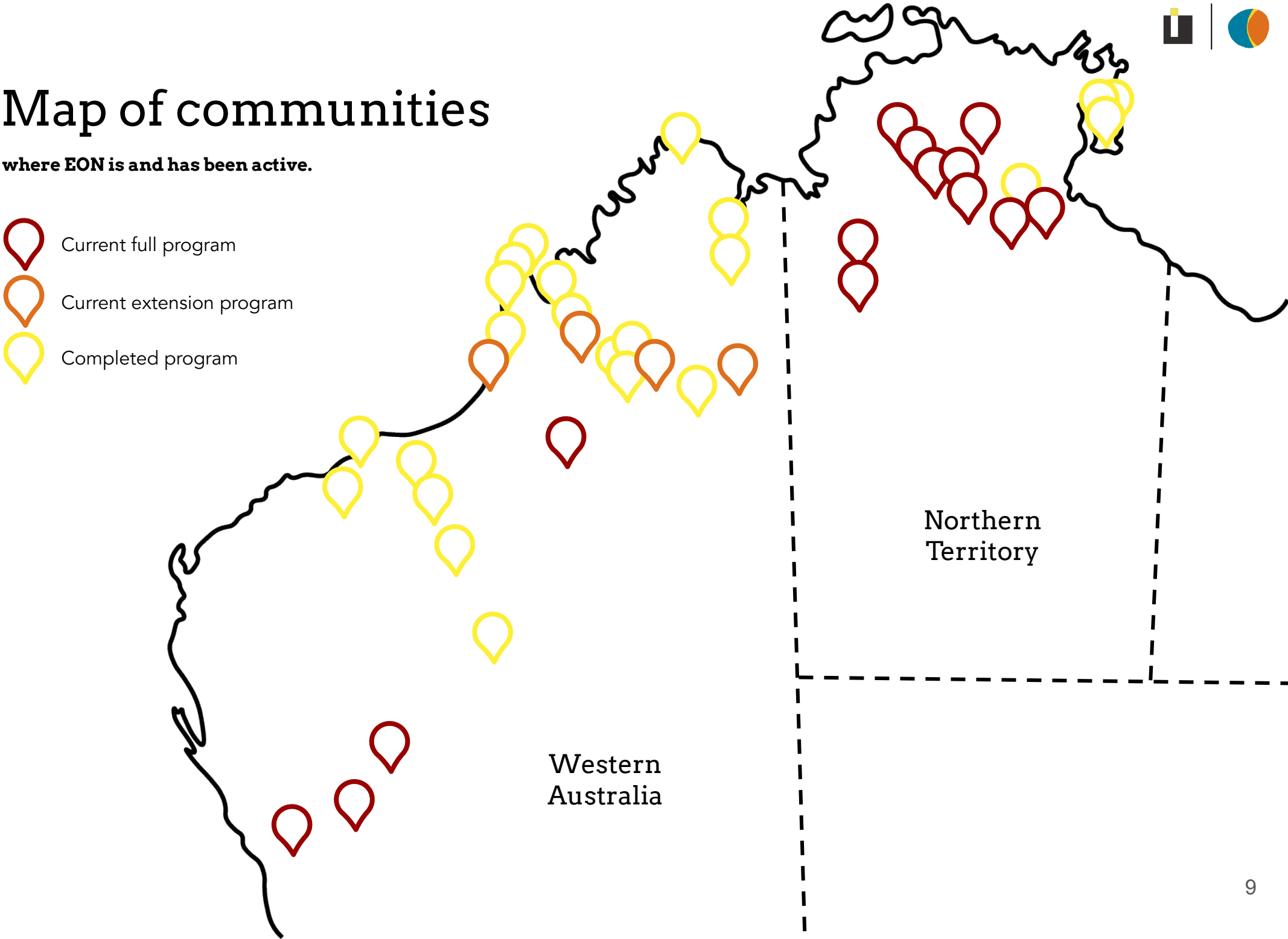
EON has now delivered their Thriving Communities program to 39 communities across Western Australia and the Northern Territory, engaging and educating thousands of children and their families about the vital link between nutrition and health.

"The EON program is changing things."

- Community member

Map of communities

where EON is and has been active.

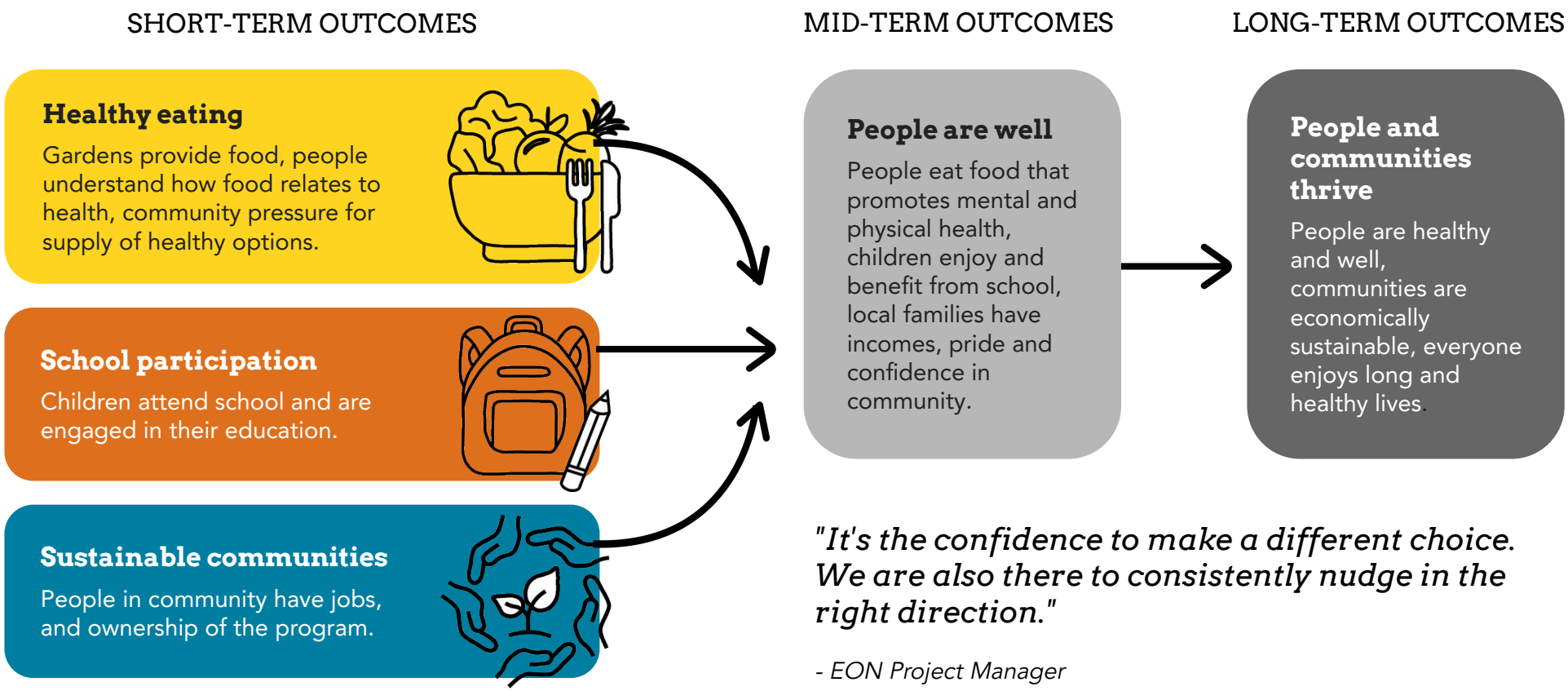


Approach

The impact we are working towards

We expect that EON's work will have short and long-term benefits for communities in the areas of health and wellbeing, as well as pride, confidence and community sustainability.

In the short-term, we expect that that school-based community gardens with result in communities having the confidence to make different food choices. We also expect to see economic opportunities for communities through the jobs created, as well as higher school attendance. In the medium-term, we expect that these things together have a positive impact on individual and community wellbeing through a reduction in nutrition-related health issues and greater economic participation. We expect that these factors will contribute to (although not in themselves achieve) long-term goals of enabling people and communities to thrive.



"It's the confidence to make a different choice. We are also there to consistently nudge in the right direction."

- EON Project Manager

The purpose of this report

Existing evaluations and ongoing monitoring have shown that many of the expected benefits are being seen.
In particular, past work has documented the following impacts:

Healthy eating

Internal and external evaluations suggest there is a strong link between Thriving Communities and positive nutrition and diet, consistently showing that the program:

- Increases knowledge of food and the link between diet and health; and
- Increases availability of diverse fresh foods locally.
- Increases skills in gardening, cooking and nutrition.

"There is 'some evidence realised across most sites' that children and adults are making better eating decisions. "

- Circa 2021

"Communities report 'major improvements in the health of our students'"

- EON 2021

School participation

Evaluations also note positive effects for school attendance and participation, including:

- Increased attendance and engagement in schools associated with the EON program - up to 15% increase on EON program days. (EON Annual Report 2023)
- Students have more energy and are less lethargic when they eat healthy foods. (Circa 2021)
- They are calmer and more attentive in schools. (Circa 2021)

"The program helps with attendance because children know when they come to school they will get a nutritious, healthy meal."

- EON Annual Report 2023

Sustainable communities

The Annual Report (2023) notes that EON employed 20 local adult community members, with the 2021 study noting "considerable evidence of the development of transferable skills for Community Assistants."

What is less well understood:

The following represent elements of program impact that there is currently less evidence of:

- Longer-term impacts on health and wellbeing
- The value of EON in creating sustainable jobs
- A quantification of costs against benefits.

The focus of this report

The relevance of diabetes as a measure

A targeted review of the existing literature suggested that diabetes is a clear and useful indicator of community health.
The following 6 key findings formed this decision:

Nutrition is linked to Type 2 diabetes

There is strong and well-established link between dietary intake and nutrition and rates of preventable chronic diseases in regional and remote Australia, particularly type 2 diabetes.

Type 2 diabetes can lead to acute health crises

Type 2 diabetes is associated with a host of comorbidities and complications, including hospitalisation and death.

Figures for diabetes were available (with limitations)

We were able to source current and past figures for the number of people with diabetes at a community level, which was necessary to show changes before and after EON's work.

Note: figures were available for the NT only.

School-based gardens have been shown to reduce diabetes

Previous evaluations have shown that school-based gardens are associated with: measurable impact on the rates of diabetes and blood sugar level; Nutrition for students, families and communities through knowledge and produce sharing and school attendance.[1]

Type 2 diabetes is high among young Aboriginal people

Aboriginal and Torres Strait Islander people, including children and youth, have some of the highest rates of type 2 diabetes in the world.

Unlike some other health conditions, diabetes is emerging among children: the peak age of onset of diabetes in remote WA is 13 years of age.[2]

Diabetes care has a significant cost, and is cost-effective to avoid

The average annual healthcare cost per person with diabetes is $4,025 (2012).[3]

In the NT, the cost to prevent one hospitalisation for diabetes ranged from $248-$739, compared to the average cost of hospitalisation of $2,915.[4]

[1] Somerset, S, Ball, R, Flett, M, and Grissman, R. (2005). School-based community gardens: Re-establishing healthy relationships with food; Weltin, A & Lavin, R. (2012). The effect of a community garden on HgA1c in diabetes of Marshallese descent.
[2] WA Health Department, personal communication.
[3] Baker IDI Heart and Diabetes Institute. (2012). Diabetes: the silent pandemic and its impact on Australia.
[4] Thomas, L, Zhao, Y, Guthridge, S, & Wakerman, J. (2014). The cost-effectiveness of primary care for Indigenous Australians with diabetes living in remote Northern Territory communities.

The method we are using: Cost Benefit Analysis

We have used a CBA to provide a quantified assessment of the value of the program, focusing on the benefits from avoiding diabetes and on employment generation for remote communities.

Below is an overview of the key assumptions and model inputs that were used to form the CBA in this report. These were chosen as they represent the most direct, specific, relevant, and measurable indicators of impact for the Thriving Communities program.

We consider EON is likely to have impact on the indicators below, however these are not quantified in this report.

Included

Diabetes incidence

The incidence of diabetes is being used as a proxy indicator of community health as:
- it is strongly linked to diet;
- it has chronic and ongoing effect on health;
- it emerges at a young age; and
- data (for the NT) was available.

Direct (cash) cost of diabetes

This consists of:
- additional costs to government from providing health services to people who have diabetes, compared to those who do not.

Indirect costs of diabetes

Based on the impact of diabetic neuropathy on quality of life, as:
- diabetic neuropathy is a common side-effect of high blood sugar;
- evidence-based monetised weights exist.

Note: This is not the direct cost of the disease, but a measure of impact on people's quality of life from living with a common side-effect of diabetes.

Number and value of jobs

Number of jobs held by Aboriginal Community Assistants directly employed by EON.

Number of community assistants who go on to hold other jobs.

Valued in terms of reduced welfare payments and increased taxation from those jobs.

Not Included

School achievement

Community gardens have been shown to have a positive impact on school enjoyment. However we have not included an assessment of this here as it is difficult to isolate the impact of a program such as EON on overall school attendance and achievement.

Quality of life

Other than the assessment of the impact of diabetic neuropathy, we have not included broader quality of life assumptions in this model.

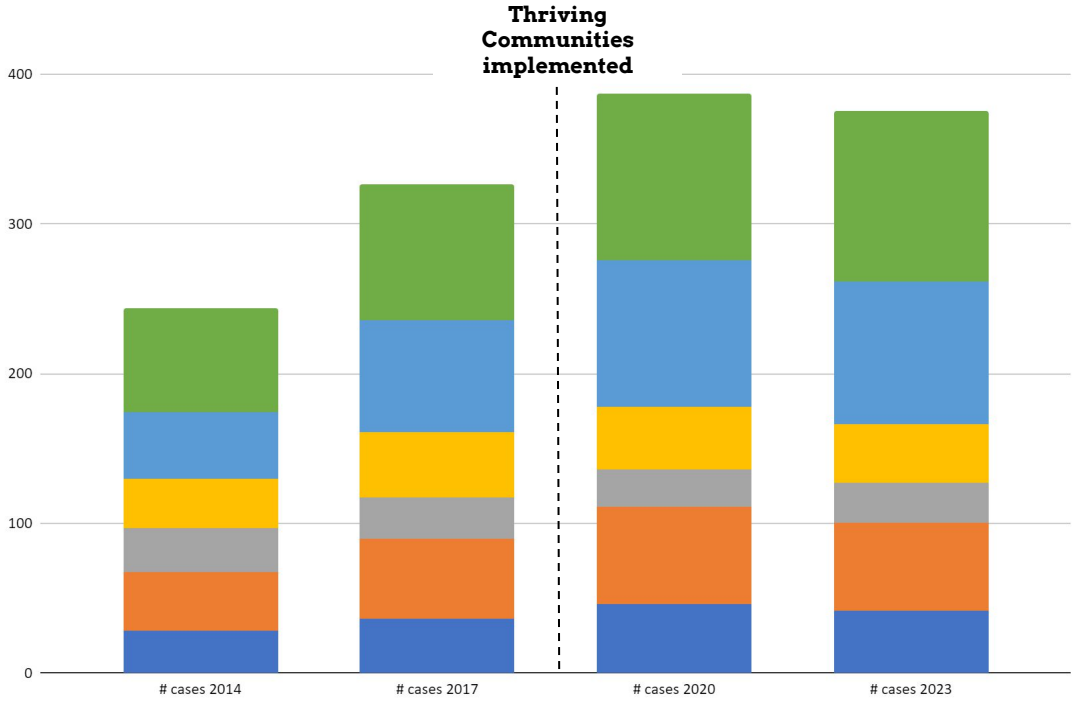
Findings

Actual instances of diabetes in EON sites in the NT

Data suggest that the instances of diabetes overall in six EON communities in the NT declined in absolute terms in four of six EON Thriving Communities sites from 2020 to 2023, with a total decrease of 13 cases (out of a population of 3,128).

We received data on the counts of persons with diabetes from Sunrise Health relating to nine communities in the NT where the EON had operated since 2019. The data provided counts of diabetes for 2014, 2017, 2020 and 2023. In six of these communities, the program had been staffed and rolled out as anticipated, while in three the program was not completed. These three communities were excluded from further analysis. This left the six EON communities of Barunga, Bulman, Jilkminggan, Minyerri, Ngukurr and Wugularr. These have been aggregated (anonymously) in Figure 1 below.

Figure 1: Aggregated cases in six NT sites (anonymised)



Source: Diabetes numbers provided by Sunshine Health. Population rates: ABS 2021.

As shown in this figure (left):

- Between 2014 and 2020 there was a steady increase in cases across the six communities (CAGR = 8.0%), compared to an overall population growth rate between 2011 and 2021 Census of 0.5%.
- Between 2020 and 2023 there was a slight decline in cases - 13 cases across the six communities - giving a CAGR growth rate (2014 to 2023) of 4.9%.
- This decline in numbers and rate of growth in cases, in absolute terms, corresponds to the implementation of Thriving Communities.

"It's the confidence to make a different choice. We are also there to consistently nudge in the right direction."

- EON Project Manager

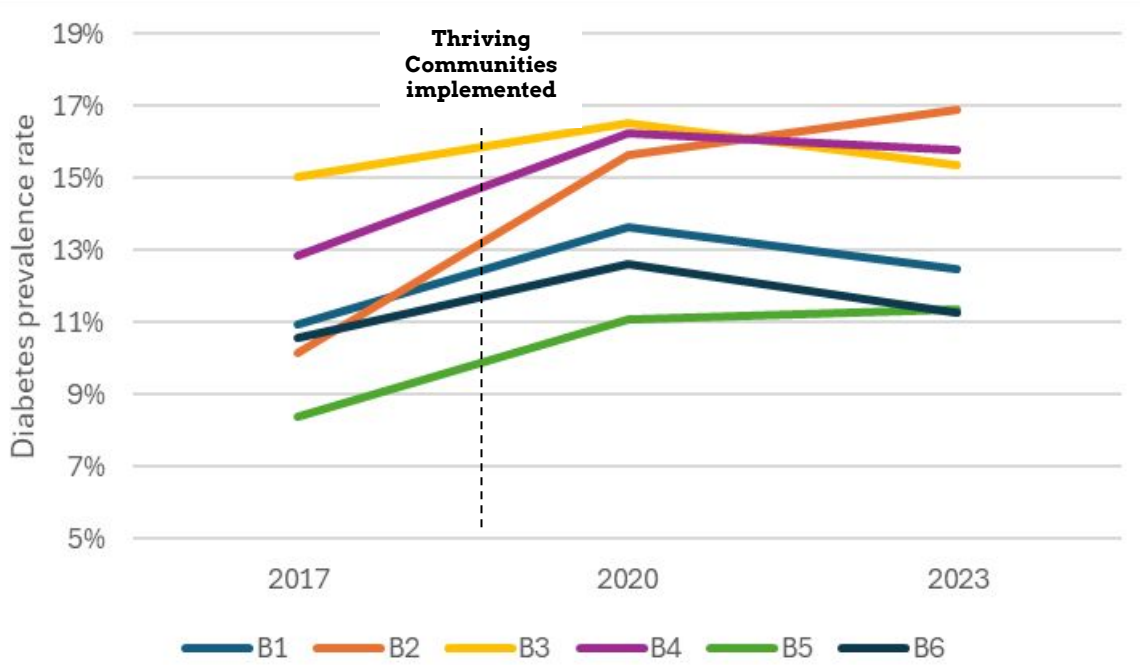
Prevalence of diabetes in EON sites in the NT

Data suggest that the prevalence of diabetes (considering the impact of population change) also declined in four of six EON communities in the NT following the implementation of the Thriving Communities program.

Population rates in remote communities vary quite markedly from year to year. Some remote communities experience substantial population growth, while in other communities populations decline. Changes in the number of persons with diabetes (or cases) alone require us to consider the impact of population change by considering not just the number of people with diabetes, but the proportion of the community with diabetes.

As such, we combined diabetes numbers with population data from the Australian Bureau of Statistics for the relevant locations to calculate the crude diabetes prevalence rate*, or the percentage of people in the community with diabetes. This is shown in Figure 2 below (sites have again been anonymised).

Figure 2: Prevalence of diabetes as a proportion of population, across 6 EON communities.



As shown in this figure (left):

- In 2017, the prevalence of diabetes in all communities was high - between 8.4 % and 15.0 % (against the Australian average of 5.3 % in 2022)
- Between 2017 and 2023, four of six communities saw an increase in prevalence rates.
- Between 2020 and 2023, four out of six communities saw a decrease in the prevalence of diabetes.
- This demonstrates that the decline in absolute numbers of diabetes cases is not a function of population change.

** Note: We have not considered the impact of age, i.e. these are not age-adjusted rates. Source: Diabetes rates provided by Sunshine Health. Population rates: ABS (ILOCs - Indigenous Locations)*

Likely program impact on diabetes in NT EON sites

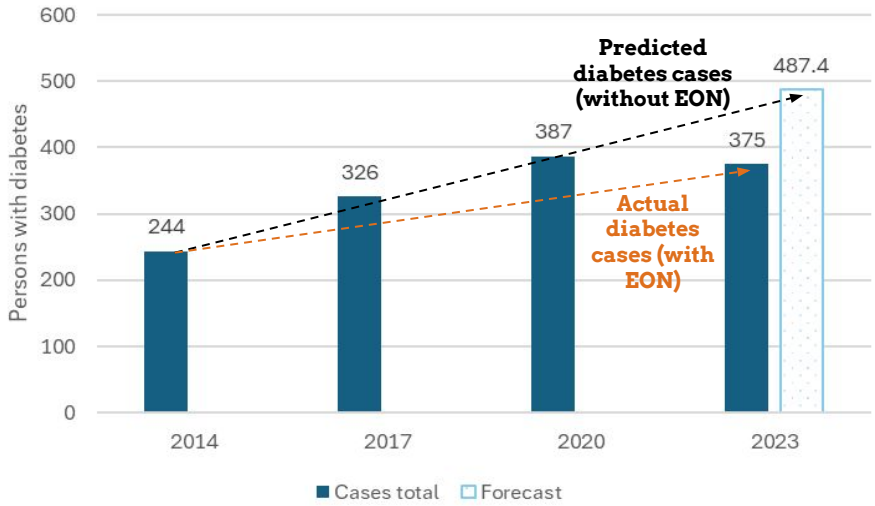
Considering the actual and likely rates of change across the communities, we consider it reasonable to estimate that around 112 fewer community members needed treatment for diabetes in 2023 in EON Thriving Communities sites, compared to what we would have expected (in a total population of 3,128).

Across the six communities, between 2020 and 2023, data suggest that the number of cases of diabetes fell from 387 to 375 people. However, to properly assess the avoided impact of diabetes, we need to also consider not just what did happen, but what may have happened in the absence of the program.

To do this, we considered the growth rate of cases between 2014 and 2020 (prior to Thriving Communities). This rose on average by 4.1 percent pa (Compound Annual Growth Rate (CAGR)). We note this is in line with growth rates recorded in similar statistics related to Aboriginal and Torres Strait Islanders and diabetes[1].

Continuing this sequence would give us predicted diabetes case numbers of 487.4 for across all six communities, against an actual number of 375. This is shown in Figure 3. This suggests the actual cases of diabetes avoided as a result of the program could have been around 112 cases.

Figure 3: Persons with diabetes across six communities between 2014 and 2023 - actual and 2023 modelled scenario forecast (without EON).



As shown in this figure (left):

- Between 2014 and 2020 there was a steady increase in cases (CAGR = 8.0%)
- If this growth rate continued between 2020 and 2023 then it is estimated there would have been 487.4 cases across the six communities.
- In fact, there were 375 cases. As such, we consider it reasonable to say that there are around 112 fewer cases of diabetes in six EON sites than could have been expected.

"It's wonderful. They now know which foods are the best ones to cook."

- Community member

[1]*CAGR for diabetes related hospitalisations was 6.8% between 2012-13 and 2018-19.*
Source: AIHW, HPF, 1.09 Diabetes, Table D1.09.12

EON's impact on employment

The Thriving Communities program has provided employment for around 27 people people in remote communities since 2022, more than 50% of whom went on to other jobs after EON.

EON is currently providing employment to six community assistants (across NT and WA), who are paid a total of $73,000 (in aggregate) in wages. Employment is casual, meaning it is able to be flexible around people's various responsibilities.

Each community is small, and has limited employment opportunities. In many cases, available jobs are filled by outside people rather than community members. As such, these community assistant positions represent an important local source of job opportunities. Project staff interviewed for this project indicated that Community Assistants were typically providing important financial support to whole households (or sometimes multiple households) through their earned wages.

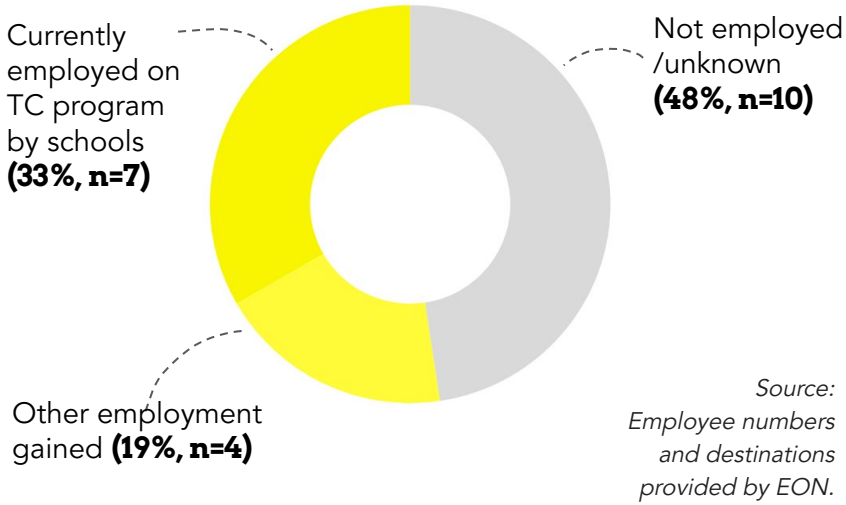
A further 21 people were employed by EON as community assistants and have since left since 2022. More than half of these people (n=11 out of 21) went on to other jobs. This is shown in Figure 4 (right).

As this figure also shows, the majority of those (n=7) continued working with the community garden program through the school. However, four gained other employment, including as rangers and school education assistants.

In 2023, EON employed and trained 20 local adult community members to build capacity, ensure sustainability of outcomes, and contribute to local job creation.

- EON Annual Report 2023

Figure 4: Employment status of Aboriginal community assistants following EON, since January 2022.



Source: Employee numbers and destinations provided by EON.

"We promote ownership over the program and future health."

- EON Program Manager

Our approach to calculating a cost benefit ratio

We have used a Cost-Benefit Analysis (CBA) to provide a quantified assessment of the value of the program, focusing on the benefits from avoiding diabetes and on employment generation for remote communities.

Below is an overview of the key assumptions and model inputs that were used to form the CBA in this report. Further details on sources and references are provided in the Appendix of this report.

Diabetes incidence

The incidence of diabetes is being used as a proxy indicator of community health as:
- it is strongly linked to diet;
- it has chronic and ongoing effect on health;
- it emerges at a young age; and
- data (for the NT) was available.

The number of diabetes cases was calculated from data provided by Sunrise Health.

Equivalent data could not be sourced for WA; hence this analysis is limited to the 6 sites in the NT only where Thriving Communities was implemented as planned.

Direct (cash) cost of diabetes

This consists of additional costs to government from providing health services for people with high blood sugar.

Costs to government, were primarily sourced from Baker IDI Heart and Diabetes Institute (2012) and the Australian Institute of Health and Welfare (2024).

This highlighted the difference in disease costs for persons without diabetes compared to those with - which, for 2020, was $1,932 vs $4,190.

The difference in these direct costs is included here.

Indirect cost of diabetes

This is based on a weighting assigned to the impact of diabetic neuropathy on the value of a statistical life year ($235,000 in 2023 dollars, provided by the Office of Impact Analysis). The Australian Institute of Health and Welfare has published disability weights (0.133) for diabetic neuropathy. This equates to a $31,255 cost per year, per person, in 2023 dollars for the impact on quality of life of diabetic neuropathy.

This has been used as a proxy measure of the impact on people's quality of life from living with a common side-effect of diabetes.

Number and value of jobs

Calculated with reference to the number of jobs held by Aboriginal Community Assistants directly employed by EON, and number of community assistants who go on to hold other jobs.

Valued in terms of reduced welfare payments and increased taxation from those jobs.

For current community assistants, this results in a part reduction in Jobseeker payments ($4,134, 2023). For past community assistants now working, we have assumed complete loss of Jobseeker ($18,226, 2023). Reductions in additional payments (eg. Rent Assistance, Family Payments) have not been included.

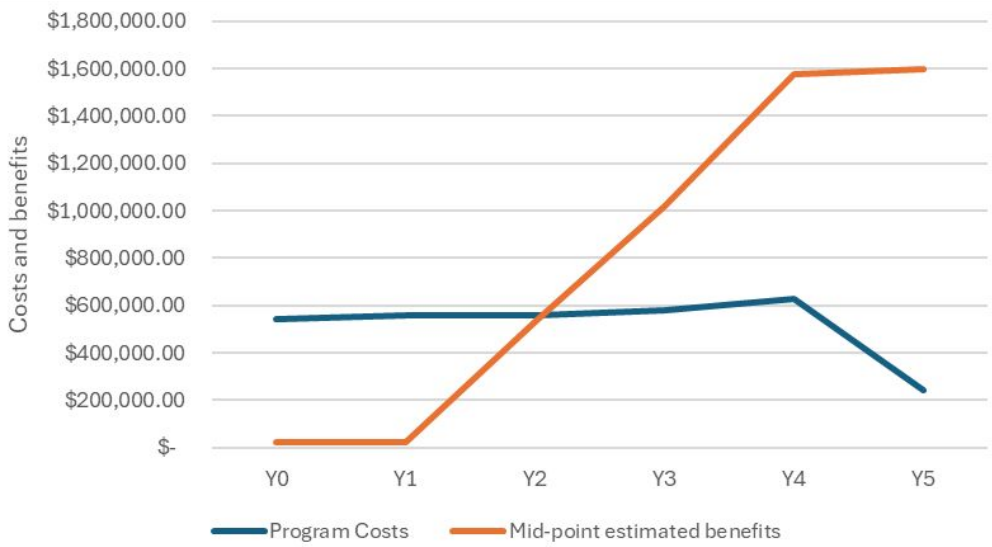
Findings: Using the CBA approach to calculate value

Applying the CBA approach outlined on the previous page across six EON sites in the NT suggests that program benefits exceed program costs by year 3. In year 4, the program delivers a benefit to cost ratio of 2.5. In year 5, the net value of estimated benefits is around $949,609 per year. Assuming no change to outcomes, these benefits would continue into year 5 and beyond.

We applied the methodology outlined to produce a Cost Benefit Analysis for the six Thriving Communities sites. This was for the five year period of the program, where year 0 = 2019 and year 4 = 2023. We have included a predicted value for year 5 = 2024. Our approach suggested:

- Assuming that no health or quality of life benefits accrue within the first two years i.e. year 0 and year 1, with benefits limited to reduced jobseeker payments for current program employees.
- Assuming benefits only accrue through the individuals that have been forecast to avoid diabetes (42.9 persons year 2, 76.3 persons year 3, 112.4 persons year 4 and year 5) - any additional impact from additional cases of diabetes avoided is not captured.
- Including only diabetic neuropathy, as the most immediate and direct health impact of diabetes, in the health calculations. Multiple other health states would be associated with later stage diabetes, e.g. chronic kidney disease.

Figure 6: Costs and benefits of EON in site project sites across the NT.



As shown in this figure (left):

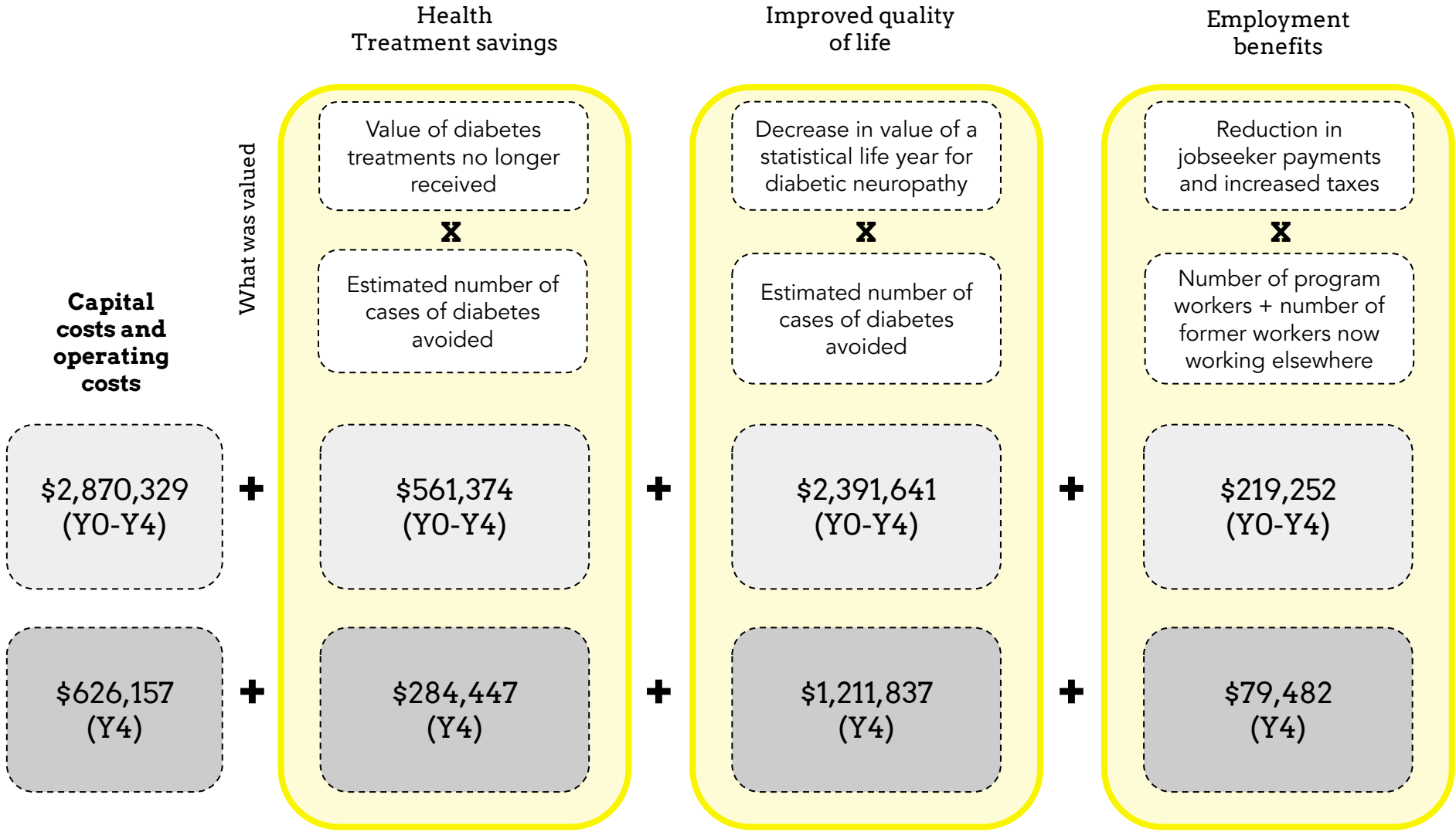
- Years 0 and 1 (Y0 and Y1) show the program costs (~$550k pa)
- Y2 the program benefits increase due to an estimated 42.9 persons avoiding diabetes. The benefits are from lower health treatment costs, as well as a 'quality of life' indicator associated with these individuals not experiencing diabetic neuropathy.
- Y3 76.3 persons avoid diabetes. Program costs are now lower than the benefits across the six communities
- Y4 112.4 persons avoid diabetes. Program costs ($626,157) are substantially lower than the estimated benefits ($1,496,284).
- Y5 assumes no additional persons avoid diabetes i.e. still 112.4 persons. Program costs drop due to shift from full to extension level of program support ($244k).

Source: Calculations by Innovation Unit.

Cost-Benefit Analysis

This table summarises the costs and benefits of the program, and provides detail about the drivers of these benefits.

The light gray boxes represent costs and benefits (in aggregate) from Years 0-4 of the program. The dark grey boxes show an annualised figure for Year 4. Year 5 continues the savings of Year 4, but with reduced program costs, assuming the program drops from full to supported status.



In Years 5 and onwards, savings continue while program costs cease or reduce.

Appendices

CBA Assumptions

The Thriving Communities program costs approximately $100,000 per annum in 2023 to deliver (in full) within an individual remote Aboriginal community. These program costs are both for capital (e.g. garden establishment) and operating (i.e. local employment) costs. The program typically runs for five years within any individual community. Following the first year, program costs drop to around $40k in 'supported' status.

Benefits from the program relate to providing:

- Health treatment savings i.e. avoiding diabetes and the associated costs.
- Improved quality of life i.e. an increase in the years of life lived in good health without diabetes. The CBA has focussed on peripheral neuropathy, which is a common health status outcome from Type 2 diabetes.
- Social benefits i.e. employment outcomes, which primarily related to reduced employment benefit payments.

The benefit types and associated weights and values are briefly described in the table below. These figures are used to calculate costs and benefits across a five year window.

Benefit Type	Description	Value (and year)	Methodological note
Health Treatment	No type 2 diabetes	$1,932 in 2020	Not adjusted (higher) for remote Aboriginal communities or service delivery by Sunrise Health
	With type 2 diabetes	$4,190 in 2020	
Quality of Life	Statistical value of a life year	$235,000 in 2023	Not adjusted for Aboriginal and Torres Strait Islander life expectancy
	Disability weight of diabetic neuropathy health status	0.133	Not adjusted for age or duration of diabetes
	Prevalence of peripheral neuropathy	0.18 and 0.51 in 2017	Not adjusted for known higher prevalence
Social benefit	Jobseeker payment per annum	$18,226 in 2023	No other payments e.g. rent assistance, family payments included
	Jobseeker payment reduction when employed by EON	$4,134	Based on earning $12,200 through EON

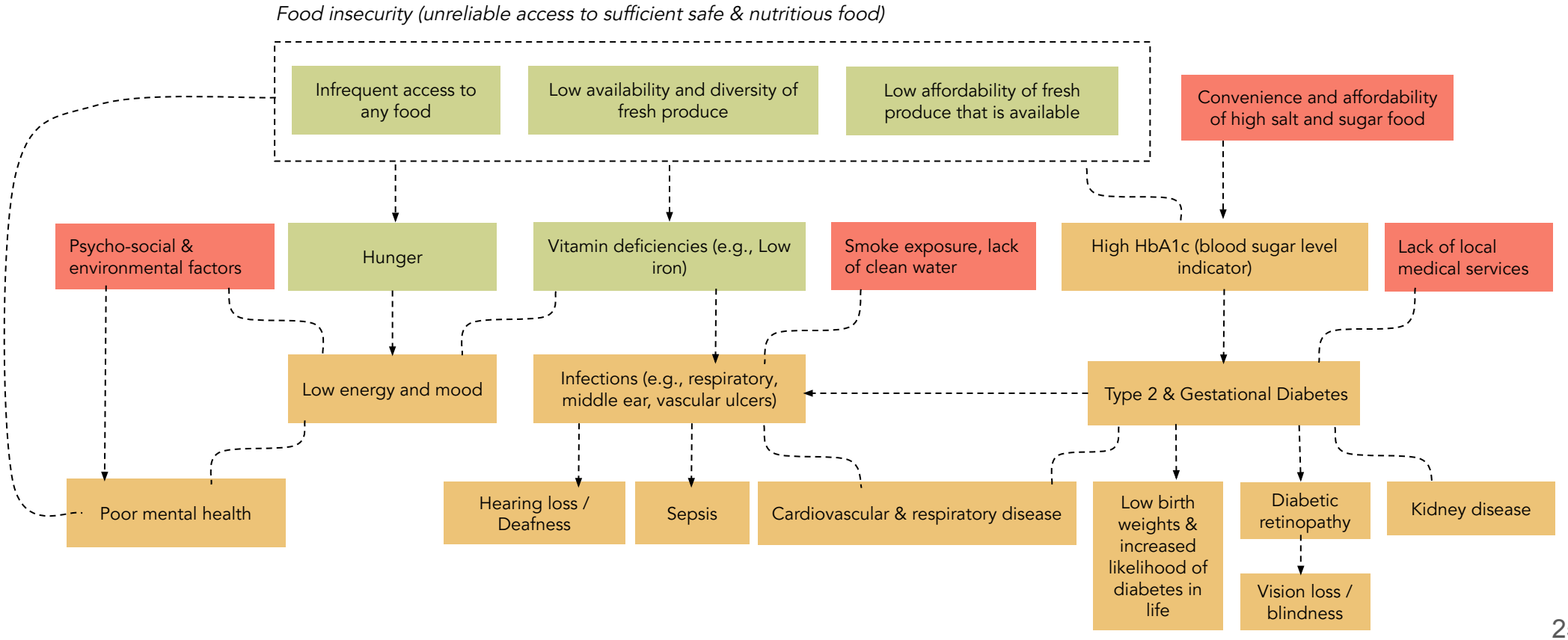
Theoretical basis for impact

How the program contributes to health outcomes

The following model visualises the paths by which the EON Thriving Communities Program contributes to reduction of primary and secondary health issues.

Key

Directly impacts | Partially impacts | Little or no impact



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