NZIER
NEW ZEALAND INSTITUTE OF ECONOMIC RESEARCH

Investing in outcomes

A societal and economic case for modernising blood cancer care in New Zealand

NZIER report to Roche NZ

June 2026

About NZIER

New Zealand Institute of Economic Research (NZIER) is an independent, not-for-profit economic consultancy that has been informing and encouraging debate on issues affecting Aotearoa New Zealand, for more than 65 years.

Our core values of independence and promoting better outcomes for all New Zealanders are the driving force behind why we exist and how we work today. We aim to help our clients and members make better business and policy decisions and provide valuable insights and leadership on important public issues affecting our future.

We are unique in that we reinvest our returns into public good research for the betterment of Aotearoa New Zealand.

Our expert team is based in Auckland and Wellington and operates across all sectors of the New Zealand economy. They combine their sector knowledge with the application of robust economic logic, models and data and understanding of the linkages between government and business to help our clients and tackle complex issues.

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Foreword

The situation for patients diagnosed with Diffuse Large B-Cell Lymphoma (DLBCL) is representative of the wider experience of New Zealand blood cancer patients. Unlike some solid tumours, blood cancers cannot be prevented through lifestyle changes or caught early through routine screening. Survival depends entirely on access to effective treatments. Yet, New Zealand's standard of care for DLBCL has remained static for the past two decades, since the funding of rituximab (in combination with first line chemotherapy standard of care) in the early 2000s.

When first line therapies fail, patients quickly deplete funded options, leaving limited pathways - intensive secondary chemotherapies, stem cell transplantation, or palliative care. This trajectory places New Zealand out of step with all the currently practiced international standards of care.

This report by the New Zealand Institute of Economic Research examines blood cancer through a broad societal lens rather than a narrow short-term fiscal perspective. By analysing the wider impact of DLBCL on society, the report demonstrates that improving patient outcomes and optimising health system efficiency are complementary.

The modelling indicates that access to highly effective treatments lowers the downstream demands on the healthcare system. Over a 20-year horizon, introducing these modern therapies is projected to prevent nearly eight-hundred New Zealanders from requiring further lines of intensive and costly subsequent treatments (including 395 stem cell transplants), without a guarantee of response or long-term remission. Sustaining long-term remission spares patients from intensive secondary regimens while yielding $40 million in direct hospital and specialist savings, freeing up vital bed hours, medical staff time, and costly diagnostic and imaging capacity across the wider health system.

Just as importantly, sustained remission supports functional recovery and economic participation. Patients are better able to maintain employment, care for their families, and minimise the financial disruption as a result of their illness. It was interesting for me to learn that even under conservative assumptions, the report projects $142 million in recovered productivity and almost $29 million in additional tax and levy revenues over 20 years, representing substantial benefits to both households and our economy.

While we must remain disciplined with public spending, true efficiency requires an integrated, long-term vision. Funding modern therapies is an investment that yields a compounding social dividend - saving productive lives and easing hospital pressure. By investing in evidence-based and effective targeted therapies, we can build a future where every New Zealander diagnosed with aggressive lymphoma has a funded pathway to long-term survival. This, as physicians, oncologists and haematologists, will be the ultimate reward for the hard work we put in trying to save our patients' lives.

Dr Samar Issa, MB ChB, FRACP, FRCPA

Consultant Haematologist

Preface

There is a traditional tendency to view public health spending through a narrow, fiscal lens—usually as a cost to be contained within a single budget cycle.

But for most New Zealanders, good health represents economic and social resilience. It is the ability to remain in the workforce, to support whānau, and to contribute to communities without the sudden, catastrophic disruption that a diagnosis like DLBCL brings.

This report by the New Zealand Institute of Economic Research gives a broader societal context to shifting this paradigm. It models what happens across the entire health system—and the wider economy—when modern, highly effective treatments are introduced early. The findings challenge the assumption that patient outcomes and fiscal discipline are in conflict. In fact, they move together.

Access to innovative therapies such as COLUMVI (glofitamab) and POLIVY (polatuzumab vedotin) will meaningfully impact the lives of more than 3,000 New Zealanders over a 20-year period – extending disease-free survival and, in some cases, avoiding further treatment altogether. This investment in better health outcomes simultaneously delivers substantial downstream economic impact. By reducing reliance on complex, resource-intensive secondary lines of care, the model projects $40 million in direct savings across hospital and specialist services. This represents a return of critical bed hours, specialist and nursing time, and diagnostic infrastructure to a deeply strained system.

Beyond the healthcare system, the societal dividend is clear. By keeping patients well and economically active, the report estimates $142 million in recovered productivity over 20 years, generating $29 million in direct tax and levy revenues to the Crown.

Combined, the quantified societal benefits of these two therapies alone are expected to exceed $265 million. While that fiscal return is significant, the true value lies in what those numbers represent: a healthier population, a more sustainable health system, a more resilient workforce, and families spared the financial and emotional toll of protracted illness.

This report does not answer every policy question. What it does show is the central role of medicines in reducing treatment demand and improving quality of life, compounding over time to generate significant economic and social benefits. It is from this informed, evidence-based position we must look to have a more sophisticated conversation about how we truly value modern medicines in New Zealand.

Matthew Needham

Director, Healthcare Ecosystem Partnering

Roche Products (New Zealand) Ltd

Key points

Blood cancers have a significant impact on New Zealanders

Around 27,000 New Zealanders are living with blood cancer, resulting from over 3,000 diagnoses per year. Every year, over 1,000 people die, more than prostate or breast cancer. It is New Zealand's third leading cause of and fastest growing contributor to cancer mortality. Diffuse Large B-cell Lymphoma (DLBCL) – a type of blood cancer and a subtype of non-Hodgkins lymphoma – is a particularly aggressive blood cancer.

Medicines play a key role in all cancers, but a critical role in blood cancers

Many cancers can be prevented or managed through cost-effective screening and early detection, minimising the burden of disease and treatment. However, blood cancers cannot be prevented or detected through screening. Early detection of blood cancer is also uncommon due to symptoms resembling many common illnesses. As a result, timely and effective treatment is critical to blood cancer outcomes.

The full benefits of effective treatment are not reflected in value assessments

Medicines value assessments are often limited to direct health system costs and quality-adjusted health years. Broader health system impacts, productivity impacts, and other fiscal impacts, as well as out-of-pocket costs, may be considered qualitatively but are not explicitly modelled, posing a risk that benefits in these areas are undervalued. This is an important limitation of conventional value assessment for medicines offering significant benefits in these areas.

Using DLBCL as a case study, this report shows the scale of this additional value

This report presents a case study of a societal perspective on value, using DLBCL and two new first- and second-line treatments that are not yet funded in New Zealand. The analysis includes productivity impacts for patients and whānau caregivers, expected tax revenue implications for government, health system savings (hospital and specialist doctor costs) from avoided treatments, out-of-pocket costs, and health outcomes.

DLBCL is an aggressive form of blood cancer that is often fatal

Up to 500 New Zealanders are diagnosed every year with DLBCL. Aggressive and often fatal, DLBCL is responsible for a significant share of lymphoma deaths in New Zealand. First-line treatment aims to be curative, but 4 out of 10 patients relapse or are refractory to first-line treatment and outcomes for these patients are poor with the currently funded second-line treatment options. Māori face both higher incidence and worse outcomes.

Innovative medicines would benefit patients who currently have few options

Two innovative medicines – polatuzumab vedotin (POLIVY®) and glofitamab (COLUMVI®) – would be used in two treatment regimens known as 'Pola-R-CHP' and 'Glofit-GemOx' for patients who are newly diagnosed with high-risk DLBCL (Pola-R-CHP) and patients who have relapsed or are refractory to first-line treatment and are not eligible for stem cell transplant, respectively, or who do not respond to a transplant after relapsing from first-line treatment (Glofit-GemOx).

The analysis takes a broad and long-term view focused on clinical potential

This analysis does not include medicine costs and therefore the report does not provide a cost-effectiveness or cost-benefit analysis. Instead, we provide the evidence required to be considered against the costs of medicines. A key feature of our analysis is the extended consideration of clinical trial progression-free survival. Rather than limiting the estimation of benefits to what has already been demonstrated by clinical trials, on the basis of the existing evidence, we project relative progression-free survival over a longer time horizon. The rationale is simply that patients and whānau cannot wait until compelling evidence becomes even more compelling. Too many will die waiting.

The results provide a case study of the potential for blood cancer medicines generally

The DLBCL case study illustrates how a broader consideration of value can show significant medicines cost offsets across the health system, tax revenue, the economy, and society. It also shows that time horizons for analysis can incorporate a conservative approach to uncertainty rather than allowing it to dominate.

These approaches are critical to understanding the investment case for blood cancer treatments in a way that supports robust decision-making without losing sight of the life-and-death gravity of the decision. This is particularly important now because DLBCL and other blood cancers have seen the standard of care in New Zealand remain largely unchanged for two decades, despite significant clinical advances.

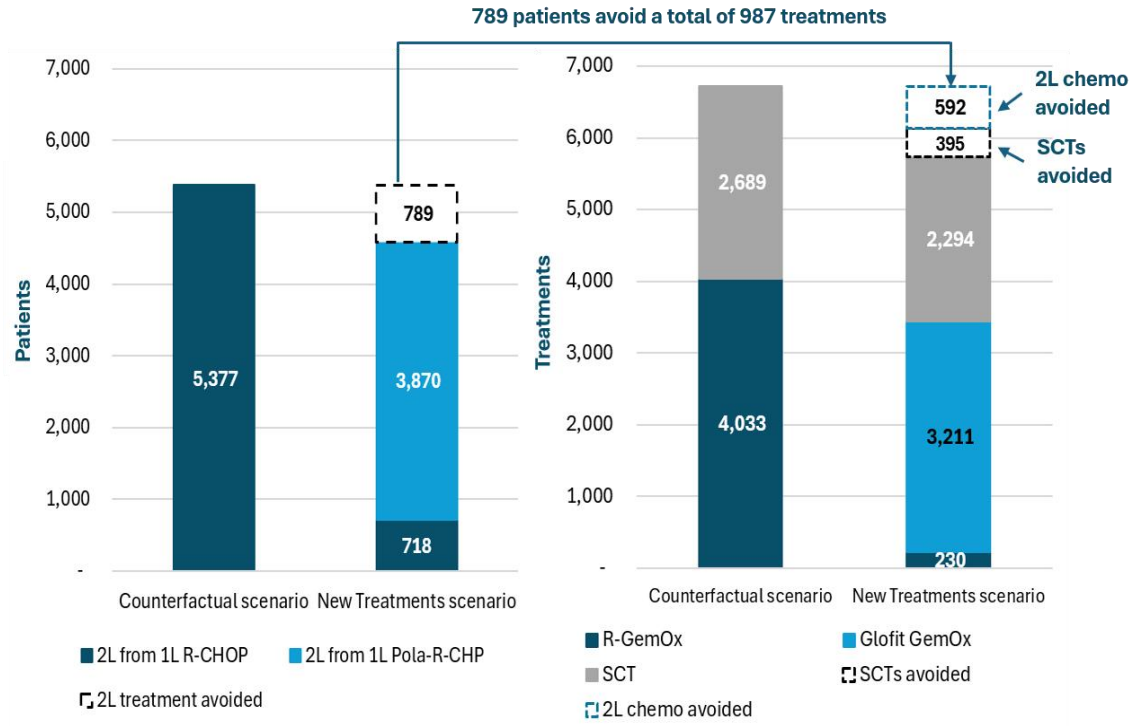
Thousands of cancer treatments are expected to be avoided

Comparing the counterfactual (status quo) to the New Treatments scenario, we estimate that the demonstrated dramatic improvements in treatment effectiveness are expected over 20 years to result in:

- 789 patients avoiding any further treatment after first-line treatment. Because some patients have both stem cell transplant (SCT) and second-line chemo, in total, the 789 patients who avoid relapse also avoid 987 courses of treatment:
  - second-line chemotherapy is avoided by 592 patients
  - SCT is avoided by 395 patients – a particularly important result, given that approximately half of these would have gone through this gruelling treatment for no benefit due to high non-response rates.
- 3,000 patients experiencing significantly longer survival, opening up options for a normal life, or simply more time with whānau, more time to plan for a dignified death, and the hope of a new, life-saving treatment to emerge.

Figure 1 The new 1L treatment results in 789 patients avoiding 987 treatments

2026–2045



Source: NZIER

Table 1 Patterns of treatment for 1L relapse and refractory patients

Number of patients having each type of treatment, 2026–2045

	Counterfactual scenario	New Treatments scenario	Difference
Initiating 2L	5,377	4,588	-789
SCT only	1,344	1,147	-197
SCT + R GemOx	1,344	77	-1,268
R-GemOx only	2,689	153	-2,536
SCT + Glofit GemOx	0	1,070	+1,070
Glofit-GemOx only	0	2,141	+2,141

Source: NZIER

$265 million in benefits is expected over 20 years

Over 20 years, these benefits amount to more than $265 million, of which nearly $69 million are fiscal benefits – health system savings and tax revenue. The breakdown of impacts is described in the table below.

Table 2 Breakdown of impacts of new treatments

Over 20 years, undiscounted

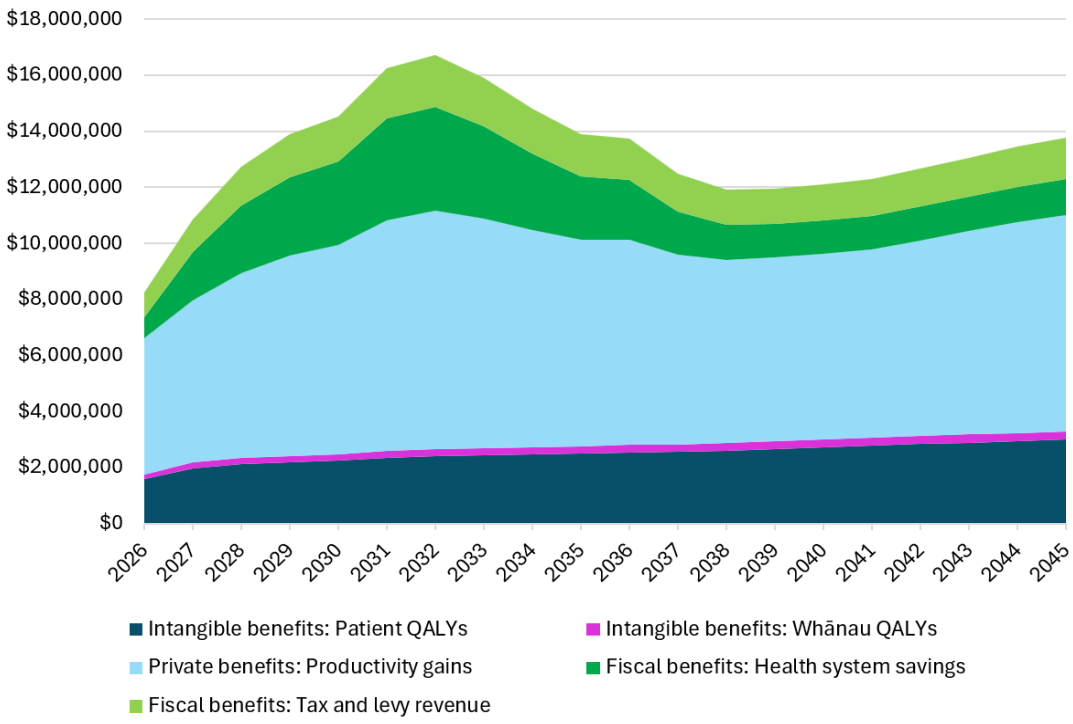
Category	Components	Total impact
Health system impacts	• Increased chemotherapy costs ($4.8 million) • Savings from avoided SCTs ($42.9 million) • Delayed palliative care ($1.9 million)	$39.9 million savings
Productivity impacts	• Increased market production ($142.0 million)	$142.0 million gained
Tax revenue	• Increased tax revenue from increased market production (28.6 million)	$28.6 million gained
Intangible benefits	• Quality of life and survival gains for patients ($49.9 million) • Quality of life gains for whānau ($5.0 million)	$54.8 million gained
Total	Total societal impacts	$265.4 million

Source: NZIER

The benefits of the new treatments are greatest in the first ten years after they are introduced, with longer-term benefits being more modest due to conservative modelling of their long-term effectiveness.

Figure 2 Total value of additional benefits from the new treatments

2026–2045, compared with the counterfactual of currently funded treatments



Source: NZIER

With an annual discount rate of 3.5 percent, the present value of total benefits is over $193 million.

The analysis balances clinical optimism with conservative assumptions

While our analysis relies on the long-term impacts of medicines that have not yet been demonstrated, the assumptions related to the extrapolation of clinical benefit beyond the observed data have been validated by both Pharmac's clinical advisory group and specialists in this area. In all other ways, our analysis is deliberately conservative:

- We know we have underestimated the likely downstream cost savings to the health system by excluding a broad range of funded services used by cancer patients, particularly those going through treatment or living with the cumulative effects of multiple lines of treatment: We only include the costs of chemotherapy, SCT and palliative care and ignore additional costs of physiotherapy, dietetic counselling, and mental health support.
- We also know we have underestimated the benefits to patients and whānau (or employers): Our productivity estimates ignore productivity benefits related to the long-term negative effects of cancer treatment, especially the cumulative effects of multiple lines of treatment.
- Key benefits excluded from our modelling and unlikely to be quantifiable, yet of immense value to whānau, are the additional value of time at the end of life: Even when patient survival is only increased by months, the additional time is likely to be of very high value to the patient and whānau. We also exclude the option value of time (the value of potential new treatments being available, or the time to choose and plan for assisted dying for those who might want this).
- From an equity perspective, because of DLBCL's inequitable impacts on Māori, the new treatments also offer the potential to help reduce health disparities – an unmonetisable benefit to society that exceeds the specific benefits to whānau Māori.

Investment decisions should aim to avoid unnecessary loss of life

The analysis demonstrates the value of considering longer-term and wider societal impacts alongside demonstrated and expected clinical evidence when assessing new treatments. In rapidly evolving areas like blood cancer, a narrow focus on short-term evidence risks overlooking meaningful benefits, particularly where waiting for published evidence will result in avoidable loss of life.

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1 Purpose and background

1.1 Roche commissioned NZIER to use DLBCL as a case study for better investment in blood cancers

There is a clear unmet need in the treatment of blood cancers in New Zealand, particularly in Diffuse Large B Cell Lymphoma (DLBCL), where the funded standard of care has remained largely unchanged for two decades despite advances in clinical evidence and treatment options.

This report is intended to inform future funding and prioritisation decisions within New Zealand's health system, including those undertaken by Pharmac and the wider Vote Health process, by demonstrating how taking a broad and long-term perspective can reveal substantial benefits that might otherwise go unvalued.

1.2 Blood cancers and DLBCL in New Zealand

DLBCL is a type of blood cancer.

There are approximately 2,800 new registrations of blood cancer each year, and about 21,000 people currently living with blood cancer in New Zealand (Ministry of Health 2025b, 3). Blood cancers represent around 10 percent of all cancers registered in New Zealand each year. Combined, they represent the 5th most common cancer, but also the third most deadly (Etcheverry 2015).

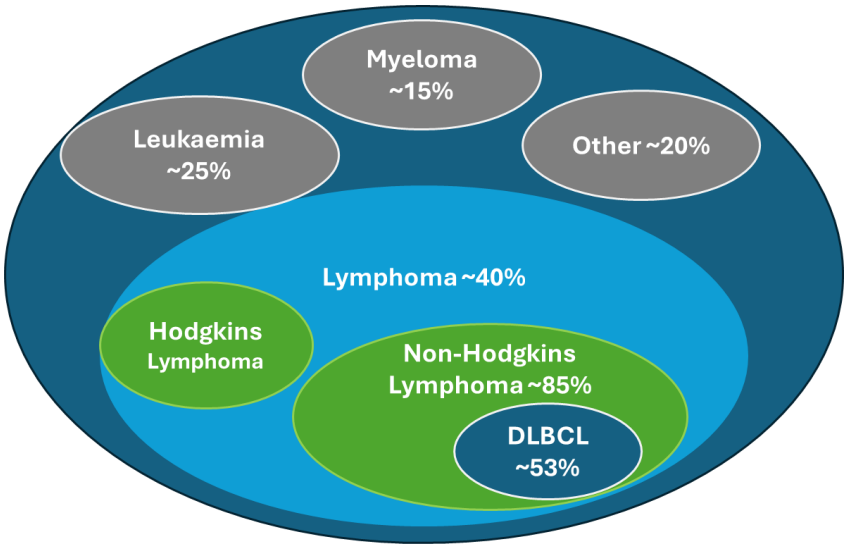
There are three main types of blood cancer: Leukaemia, Myeloma, and Lymphoma:

- Leukaemia develops from dysfunctional immature cells ("blasts") in the bone marrow. They rapidly reproduce, preventing the creation of healthy red blood cells, platelets, and normal white blood cells (Blood Cancer NZ, n.d.).
- Myeloma develops from abnormal plasma cells in the bone marrow, which multiply and produce faulty proteins (paraproteins), causing them to crowd out healthy blood cells, damage bones, and impair the immune system and kidneys (Blood Cancer NZ, n.d.).
- Lymphoma normally starts in the lymph nodes but can occur in any part of the lymphatic system when the lymphocytes (white blood B- or T-cells) lose their ability to fight infection. Lymphoma cells multiply and can form tumours (lumps). DLBCL is the most common type of non-Hodgkins Lymphoma (NHL).

Figure 3 below provides a rough estimate of the proportion of each type registered in New Zealand each year.

Figure 3 Types of Blood Cancers in NZ

Estimated proportion of individual diagnoses within blood cancers



Source: NZIER

1.3 Prevention and screening are not an option for blood cancers, so medicines play a critical role

With increased understanding of risk factors and advances in the sensitivity and specificity of screening modalities, prevention and early detection are becoming increasingly recognised as cost-effective strategies for many cancers.

This is not possible for blood cancers. Increased investment in cancer prevention and early detection will not reduce the need for effective treatment for blood cancers.

"…achieving fewer cancers, better survival and more equitable cancer outcomes for New Zealanders requires action across the entire cancer continuum (from prevention right through to palliative care)"

(Te Aho o Te Kahu 2024)

1.4 New Zealanders with blood cancer have relatively poor access to medicines

New Zealand has a well-recognised gap in access to modern blood cancer therapies compared with similar countries. This leaves New Zealanders unable to access what is now the standard of care internationally.

As noted in the State of Blood Cancer 2026 report (Blood Cancer NZ 2026), for patients, the lack of treatment options narrows the treatment pathways available to blood cancer patients:

- Fewer options at the point of diagnosis reduce the likelihood of achieving optimal outcomes from the outset.

- Treatment options are exhausted more quickly, across relapsing and refractory disease, meaning many more patients receive the news that palliative care is now their only option.
- Reduced access to therapies with curative potential limits the opportunity for long-term survival or cure, effectively only buying limited time to say goodbye.

Table 3 shows that the list of medicines funded for blood cancer patients in Australia includes many options that are not funded in New Zealand, including the two innovative medicines for DLBCL that informed this case study polatuzumab vedotin (POLIVY) and glofitamab (COLUMVI).

Table 3 Examples of blood cancer medicines funded in Australia but not in New Zealand

Blood cancer type	Medicines funded in Australia but not in New Zealand
Acute myeloid leukaemia	• Gilteritinib • Oral azacitidine (maintenance therapy) • CPX-351 (liposomal daunorubicin + cytarabine) • Decitabine + cedazuridine (INQOVI)
Acute lymphoblastic leukaemia	• Blinatumomab • Tisagenlecleucel (CAR T-cell therapy)
Chronic myeloid leukaemia	• Asciminib • Ponatinib • Nilotinib (first-line) • Dasatinib (first-line)
Chronic lymphocytic leukaemia	• Acalabrutinib • Idelalisib
Non-Hodgkins lymphoma **(including DLBCL)**	• Acalabrutinib • Zanubrutinib • **Glofitamab** • Axicabtagene ciloleucel (CAR T-cell therapy) • Tisagenlecleucel (CAR T-cell therapy)
Multiple myeloma	• Daratumumab • Carfilzomib • Selinexor • Elranatamab
Myeloproliferative neoplasms	• Momelotinib • Ruxolitinib (polycythaemia vera)
Myelodysplastic syndromes	• Decitabine + cedazuridine (INQOVI)
Graft-versus-host disease	• Ruxolitinib

Source: NZIER, based on Blood Cancer NZ (2026)

1.5 DLBCL is a particularly aggressive blood cancer

DLBCL is an aggressive blood cancer that is responsible for most lymphoma-related deaths. It is seen across all age groups, but is most common in people over 50 years of age (Blood Cancer New Zealand 2025).

The risk of DLBCL progression is highest within the first 24 months. Initial treatment using currently funded medicines is only effective for 60 percent of DLBCL patients. This has been the standard of care for 20 years, with most experimental regimens trials failing to improve survival in clinical trials.

The cure rate drastically reduces with relapse. Outcomes are poor for patients with relapse or refractory (RR) DLBL. A recent analysis of a large population-based cohort of 736 patients

with RR DLBCL treated in Sweden between 2007 and 2018 reported a median overall survival rate of 6.6 months (Harrysson et al. 2022).

1.6 The age of DLBCL patients has important economic and fiscal implications

Clough et al. (2024) identify the age demographics of non-Hodgkins lymphoma and DLBCL patients. The study quantifies NHL cases and cases of a subgroup identified as High Grade B Cell cancers, which are predominantly DLBCL cases. The study only provides age data for Māori and Europeans, so we scale the numbers in each age group to reflect the additional 15 percent of the population that is non-Māori, non-European (see Table 4 below).

Table 4 NHL and DLBCL by age group

Estimated annual cases, 2007–19

	NHL		DLBCL	
	Number	%	Number	%
<25	15	2%	9	2%
25–49	95	11%	48	10%
50–64	233	26%	123	25%
65–74	249	28%	141	29%
75+	297	33%	173	35%
Total	889	100%	494	100%

*Incidence of DLBCL is based on the study's reported incidence of high-grade B-cell cancers

Source: NZIER, based on Clough et al. (2024b)

Even though DLBCL is a disease of increasing age, over a third of DLBCL patients (37 percent) are under 65, and a further 29 percent are aged 65 to 74, an age range in which New Zealanders are increasingly fully engaged in the workforce. This means a lack of access to effective treatment for DLBCL is associated with productivity losses and fiscal costs:

- Absenteeism and presenteeism may not reduce incomes to patients and caregivers (unless they are casual workers, in which case absenteeism will have that effect), but they reduce production without a commensurate reduction in costs, and therefore reduce revenue and profit to firms, which flows through as reduced tax revenue for the government.
- Early retirement due to disease, the cumulative effects of treatment on people's ability to work, or simply the re-evaluation of life priorities that many cancer patients experience (especially high-income earners in their 50s or 60s), reduces tax revenue to the government and may increase welfare dependency, as not all people forced to withdraw from the workforce can afford to support themselves.
- Lost years of work due to premature death represent a total loss of production to the economy, a loss of income to whānau, and years of lost tax revenue to the government. Many families will lose the person whose income they rely on to get by, increasing the need for income support.

1.7 Current treatment of DLBCL in New Zealand

The treatment burden of DLBCL is substantial, often involving immediate and intense chemotherapy and potentially stem cell transplants. And as patients progress through treatment, the cumulative impact of those treatments increases, leading to higher rates of adverse events. Fatigue, appetite loss, painful swelling, bone pain and shortness of breath are amongst the many symptoms reported by patients and their doctors.

A recent survey commissioned by Roche sought to highlight the quality of life and financial burden on New Zealanders diagnosed with lymphoma. This survey sheds some light on the emotional toll, including feelings of emptiness, guilt, fear, grief and nervousness about the future. Patients also express frustration with tiredness and not being able to function as they did previously, or being overwhelmed with medical information. Thoughts of death or self-harm are also shared.

The treatment burden also extends to the patient's wider family and friends, with survey respondents outlining multiple aspects of their lives impacted by lymphoma. These include missing milestone events such as weddings and significant birthdays, not being able to care for family members, not being able to maintain their house and garden, or not being able to participate in day-to-day social activities, including recreational activities and shopping.

1.8 Current treatment options

As with most treatments for cancer and chronic diseases, first-line treatment (1L) is the initial, best-known, and most effective therapy prescribed for a newly diagnosed condition. Second-line (2L) treatment is indicated when the first line fails (refractory), the disease comes back (relapse), or the chemotherapy has to stop due to intolerable side effects; likewise for third-line (3L) and beyond (4+L). These lines represent a sequential approach to managing disease progression.

First-line (1L) treatment

The current preferred funded treatment for newly diagnosed and previously untreated high-risk DLBCL is a combination of medicines known as R-CHOP (a combination of rituximab, cyclophosphamide, doxorubicin, vincristine and prednisolone/prednisone. While it aims to be curative, the reality is that up to 40 percent will become refractory or relapse soon after treatment, requiring 2L treatment for any chance of meaningful survival.

Second-line (2L) treatment

Chimeric Antigen Receptor T-cell therapy (CAR-T) is often preferred for early relapse (less than 12 months), but this is currently only available in New Zealand through clinical trials with strict criteria, which many patients will not meet, and with strictly limited capacity.

Stem-cell transplant (SCT) is a standard 2L treatment for relapsed or refractory (RR) DLBCL, typically favoured for those who relapse more than 12 months after initial therapy, but again, eligibility criteria are strict and typically exclude higher-risk patients (those with an International Prognostic Index (IPI) score of 3 to 5[1]).

[1] The International Prognostic Index (IPI) is a widely used clinical tool in oncology that predicts the prognosis (outcome) for patients with DLBCL. The IPI categorises patients into risk groups based on age, disease stage, and other clinical factors.

For those who do not qualify for SCT (approximately 50 percent) or who do not respond to SCT (approximately 20 percent of those who are eligible – 25 percent overall[2]), the most used 2L treatment for RR DLBCL is a combination of medicines known as R-GemOx (rituximab, gemcitabine, and oxaliplatin).

According to clinical experts, patients who experience treatment failure in the first-line experience significant morbidity due to salvage chemotherapy or other treatments that are associated with toxicities and lower cure rates (Canadian Agency for Drugs and Technologies in Health 2024).

1.9 Proposed new treatment options

There are now two new medicines for DLBCL that are registered by Medsafe and yet to be funded, which are the focus of this analysis:

- Polatuzumab vedotin (POLIVY®)
- Glofitamab (COLUMVI®).

Polatuzumab vedotin is registered as a 1L treatment for adult patients with DLBCL. It is used in combination with rituximab, cyclophosphamide, doxorubicin and prednisone in a regimen hereafter referred to as 'Pola-R-CHP'. Pharmac's Cancer Treatments Advisory Committee (CTAC) recommended that Pola-R-CHP be funded for IPI 2–5 with a low priority, and for IPI 3–5 with a medium priority. As a result of this advice, the analysis in this report focuses on high-risk (IPI 3–5) patients. These patients have a low 5-year overall survival of 33 percent to 55 percent with R-CHOP and are most likely to benefit from increased survival because of gaining access to Pola-R-CHP. Patients with lower IPI scores will continue to be treated with R-CHOP. Currently, 45 percent of 1L treatment patients have an IPI score of 3–5.

Glofitamab is registered by Medsafe and indicated for the treatment of adult patients with RR DLBCL not otherwise specified (DLBCL NOS) who are not candidates for autologous stem cell transplant (ASCT). For these patients, glofitamab is used in combination with gemcitabine and oxaliplatin in a treatment regimen hereafter referred to as 'Glofit-GemOx'. This is proposed as an alternative treatment to the current treatment regime known as 'R-GemOx'. Glofitamab is also indicated as monotherapy for the treatment of adult patients with relapsed or refractory DLBCL after two or more lines of systemic therapy.

Table 5 sets out the current and proposed treatment with the new medicines.

[2] Based on information supplied by Roche.

Table 5 Proposed new treatment of DLBCL patients

Line of treatment	Current treatment	New treatment	Medicine needing funding for new treatment
1L treatment for patients with IPI score 0–1	R-CHOP	R-CHOP	
1L treatment for patients with IPI score 2–5	R-CHOP	Pola-R-CHP	Polatuzumab vedotin (Polivy®)
2L treatment	R-GemOx	Glofit-GemOx	Glofitamab (Columvi®).

Source: Roche NZ

1.10 Effectiveness of the new medicines

The POLARIX trial showed that Pola-R-CHP provided greater efficacy for progression-free survival (PFS) compared with R-CHOP (Tilly et al. 2019). The trial showed that Pola-R-CHP offers a statistically significant clinical benefit: a 27 percent reduction in the risk of progression, relapse, or death compared with R-CHOP. This means more patients will achieve long-term survival and do not move on to subsequent treatment. These results have been confirmed with 5 years follow-up in clinical studies.

The STARGLO clinical trial (Abramson et al. 2024) showed that median overall survival nearly doubles with Glofit-GemOx as 2L or subsequent treatment compared with the currently available alternative, R-GemOx – from 12.9 months to 25.5 months.[3] This result was achieved in a sample comprising patients who had one or more previous lines of treatment. Sixty-three percent of patients were 2L (one prior treatment), and a large proportion (37 percent) had 2 or more prior lines of treatment. The median overall survival of 25.5 months reflects the full study group. In a subgroup analysis of the 2L treatment-only population, the median overall survival had not been reached at follow-up.

Table 6 Key components of the 1L proposal

Component	Description
Population	Adult patients with previously untreated DLBCL and an IPI score of 3–5
Intervention	6 cycles of Pola-R-CHP plus 2 cycles of rituximab monotherapy (21-day cycles)
Comparator	6 cycles of R-CHOP plus 2 cycles of rituximab monotherapy (21-day cycles)
Outcomes	Primary endpoint: Progression-free survival

Source: NZIER, based on information supplied by Roche

Table 7 Key components of the 2L proposal

Component	Description
Population	Adult patients with relapsed or refractory DLBCL after one or more lines of systemic therapy, who are ineligible for ASCT.
Intervention	Glofit-GemOx treatment regimen, consisting of eight cycles of glofitamab in combination with gemcitabine plus oxaliplatin, plus four cycles of glofitamab monotherapy (21-day cycles). The regimen also includes other treatments to mitigate the risk of infusion-related side effects.
Comparator	R-GemOx treatment regimen, consisting of eight cycles of rituximab in combination with gemcitabine plus oxaliplatin (21-day cycles).
Outcomes	Primary endpoint: Overall survival* Secondary endpoints: • Progression-free survival* • Event-free survival • Response rates, including complete response, partial response, progressive disease, stable disease, overall response rate • Duration of response, including duration of complete response and duration of response • Adverse events • HRQoL*

*This report considers only the primary endpoint of overall survival and secondary endpoints of progression-free survival and health-related quality of life (HRQoL)

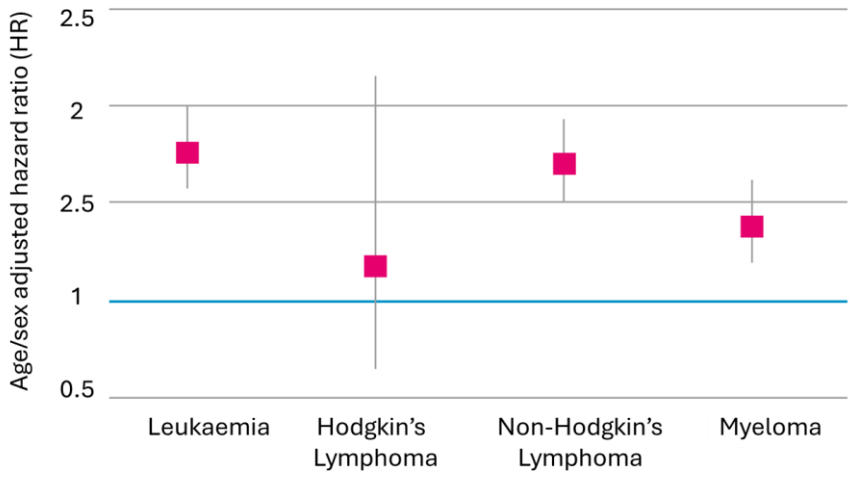
Source: NZIER, based on information supplied by Roche

1.11 Māori are expected to disproportionately benefit from effective treatment

A question of particular interest for New Zealand will be how the new treatments may benefit different groups, including Māori. Although data on Māori with DLBCL were not available for this analysis, Māori are expected to benefit disproportionately from the new treatments because:

- Māori are twice as likely to die after a diagnosis of any cancer as non-Māori (Gurney et al. 2020)
- Māori have a higher incidence of all forms of blood cancer (Clough et al. 2024)
- Māori have lower cancer-specific survival from all forms of blood cancer (Clough et al. 2024).
- Māori are 1.71 times more likely to die after an NHL cancer diagnosis, compared to Europeans (see Figure 4 below) (Clough et al. 2024).

Figure 4 Hazard ratios for mortality in Māori vs European blood cancer patients



Source: Clough et al. (2024)

Although no data were available showing IPI scores[4] for Māori, given the significantly higher mortality for Māori, Māori patients are likely to be considered high-risk at diagnosis. This means that Māori would be more likely to be eligible for 1L Pola-R-CHP and more likely to benefit from 2L Glofit-GemOx.

The new treatments provide a credible pathway to reducing disparities in DLBCL outcomes for Māori.

[4] The International Prognostic Index (IPI) is a widely used clinical tool in oncology that predicts the prognosis (outcome) for patients with DLBCL. The IPI categorises patients into risk groups based on age, disease stage, and other clinical factors.

2 Our approach

Our approach is based on a societal perspective of the impacts of the new medicines beyond their purchase price. We address the question:

What additional costs and benefits would be expected if Pharmac were to fund the new medicines for eligible DLBCL patients, considering the perspectives of the health system and government, as well as individuals and families?

2.1 Perspective

Medicines are challenging to assess in a report that aims to support improved public understanding of their value because the prices of medicines – a key cost factor underlying their investment value – are negotiated between pharmaceutical companies and Pharmac and are commercially sensitive. For this reason, a full cost-benefit analysis is not possible.

However, as blood cancers, their treatment, and the impacts of new medicines on New Zealanders with blood cancers are poorly understood, there is value in an incomplete assessment that focuses on the other costs and benefits these medicines may provide. For this reason, our analysis takes a modified conservative societal perspective, including:

- Health system costs and benefits, except for medicine costs
- Patient and whānau productivity impacts
- Impacts on tax revenue to government associated with productivity impacts
- intangible costs and benefits associated with such factors as life years and quality of life for both patients and whānau.

Table 8 below provides an overview of the categories of impacts that we estimate as benefits and costs of the new treatments.

Table 8 Categories of impacts estimated as benefits and costs

Category	Estimated components	Perspective
Hospital costs and palliative care costs	Costs associated with planning care, administering the treatment regimens, and monitoring patients being treated, including bed time, specialist doctor and nurse time and hospital overheads for: • chemotherapy • SCT Palliative care delayed (value of delay only)	Government/fiscal (Health system)
Indirect costs	Value of lost market production	Society
Lost tax revenue	Lost tax revenue to government due to reduced productivity	Government/fiscal
Quality and quantity of life years	• Enjoyment of life • Length of life	Individual, whānau

Source: NZIER

2.2 Scenarios analysed

Our approach differs from traditional medicine assessment in an important way: We consider the joint impact of two medicines being funded at the same time. While some patients may be able to receive other 1L treatments, we focus on those patients who, in the absence of funding for the new medicines, would be treated with the standard 1L R-CHOP + 2L R-GemOx sequence.

Our analysis is based on two scenarios:

1 **The Counterfactual scenario:** The Counterfactual scenario is the status quo in which DLBCL patients are treated with R-CHOP as the 1L treatment and R-GemOx as the 2L treatment. The Counterfactual scenario factors in:

   a The uptake rate for 1L treatment provided by Roche.

   b The annual rates of progression to 2L treatment from 1L R-CHOP, based on evidence from clinical trials.

   c The proportion of patients who are eligible for SCT after 1L relapse and the proportion who do not respond, based on local clinical advice.

   d The annual rates of progression to 3L treatment from 2L R-GemOx, based on evidence from clinical trials.

   e The number of cycles and hours of bed time involved in treatment cycles is based on relevant Medsafe Data Sheets (Medsafe, n.d.) and publicly available cancer treatment protocols.

   f Patient survey insights into productivity losses associated with blood cancer treatment (estimated as a function of the number of treatment cycles and bed hours per cycle).

2 **The New Treatments scenario:** This scenario considers how funding of polatuzumab vedotin and glofitamab, enabling 1L treatment with Pola-R-CHP and 2L treatment with Glofit-GemOx from 2026, would alter disease progression, costs and health outcomes. Because the scenario considers the simultaneous funding of both new medicines, some patients who did not have access to Pola-R-CHP as their 1L treatment may still access Glofit-GemOx if they progress to 2L treatment from 2026 onwards. This scenario factors in:

   a The estimated rate of take-up of 1L treatment (assumed to be the same in both scenarios).

   b The expected take-up of the new treatments and consequent market shares of the new treatments versus the existing funded treatments over time, as advised by Roche.

   c The annual rates of progression to 2L treatment from Pola-R-CHP are based on evidence from clinical trials.

   d The proportion of patients who are eligible for SCT after 1L relapse and the proportion who do not respond, based on advice from Roche (assumed to be the same as in the counterfactual).

   e The annual rates of relapse after 2L treatment, resulting in patients progressing to palliative care.

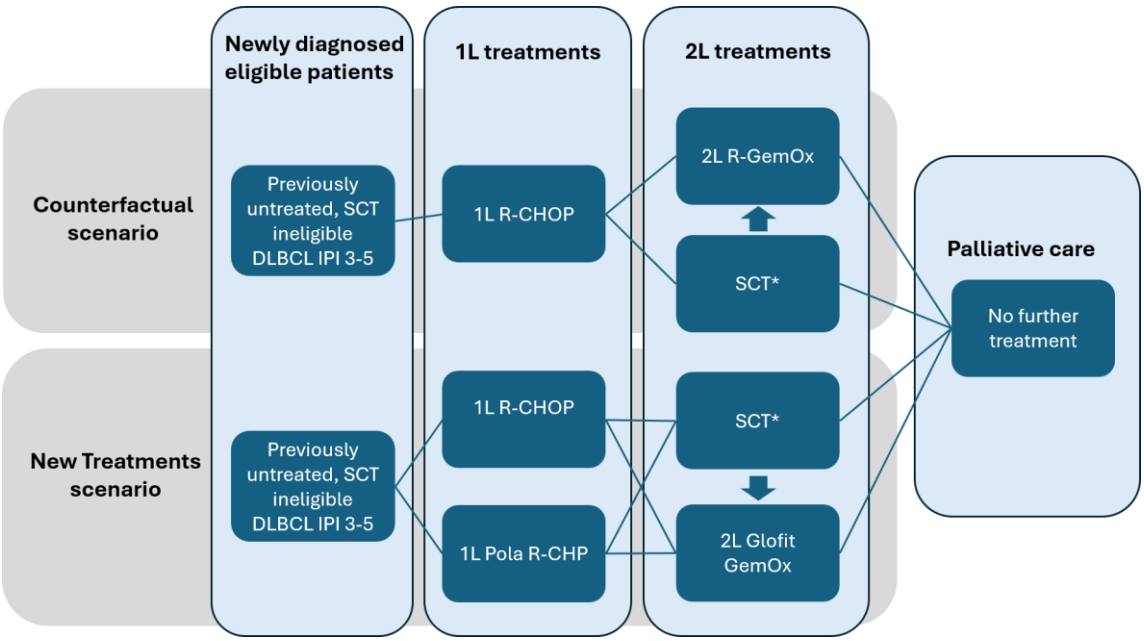
f The number of cycles and hours of hospital bed time involved in treatment cycles, based on relevant Medsafe Data Sheets (Medsafe, n.d.) and publicly available cancer treatment protocols.

g Patient survey insights into productivity losses associated with blood cancer treatment (estimated as a function of the number of treatment cycles and bed hours per cycle).

The specific data for both scenarios is described in more detail in section 2.3.

Patients are modelled as following different treatment pathways, as shown in the figure below. The key pathway to note is that patients treated with R-CHOP as their 1L treatment before the new treatments become available would increasingly be treated with Glofit-GemOx as their 2L treatment if they relapse in the New Treatments scenario.

Figure 5 Counterfactual and New Treatments scenarios' pathways



*SCT = Stem cell transplant. A proportion of patients eligible for SCT are expected not to respond and require 2L R-GemOx or 2L Glofit-GemOx.

Source: NZIER

2.3 Key evidence and data

We bring together available data and published evidence on the patient population, the effectiveness of the medicines, treatment paradigms, and the direct, indirect, and intangible costs associated with DLBCL and its treatment. The evidence used includes data extracted from published studies, results from clinical trials (provided by Roche), data from Middlemore Hospital describing DLBCL incidence (unpublished), treatment take-up and resource use in the New Zealand hospital context, and insights from Roche's DLBCL patient survey.

Table 9 below shows the types and sources of evidence used.

Table 9 Evidence types and sources

Parameter	Details	Source
Patient population (incidence of DLBCL)	53% of new NHL diagnoses	Middlemore Hospital data and Health NZ Cancer Database accessed February 2026
Growth rate in incident cases of DLBCL	3% per annum	NZ Cancer web tool (Health New Zealand 2026)
IPI distribution (IPI Score in newly diagnosed patients)	IPI 0 11.50% IPI 1 21.40% IPI 2 22.40% IPI 3 23.40% IPI 4 15.60% IPI 5 5.70% IPI 3–5 44.70%	Clinical trial evidence provided by Roche
1L treatment uptake	87%	Middlemore Hospital registry data
Take up of Pola-R-CHP and Glofit-GemOx	60% in 2026 90% in 2027 95% from 2028	Advised by Roche – Note this is a conservative scenario compared with Pharmac's CTAC advice, which indicated an immediate switch to the new treatments would be expected.
Effectiveness of treatments	Described in relevant sections	Clinical trial evidence provided by Roche and New Zealand clinical practice data provided by Middlemore Hospital
Proportion of patients eligible for SCT as 2L treatment	50% of 1L relapsed patients	Advised by Roche based on clinical advice
Patients receiving 2L SCT not responding and requiring R-GemOx or Glofit-GemOx as 2L treatment	50% of 2L SCT patients	Advised by Roche based on clinical advice
Hospital resources and specialist doctor time used in administering treatments	Based on cycles of treatment and bed hours per cycle (see Section 142.4 below)	Treatment cycles and bed hours advised by Roche Specialist doctor time based on conservative assumptions described in Section 142.4 below
Cost of hospital resources and specialist doctor time	$150 per bed hour (nurse and overheads) $232 per hour of specialist doctor time	Bed hour nurse and overhead costs advised by Pharmac Specialist doctor time: Treasury CBAx
Cost of stem cell transplant	$108,429	Estimated (see section 2.5 below)
Cost of palliative care	$12,432	Inflated from $8,050 (Pharmac cost manual 2028) using CBAx model Value of delayed palliative care (2 years) used to estimate health system savings from progression-free survival after 2L treatment.
QALYs / Utilities in health states	See Section 2.5 below	Roche

Parameter	Details	Source
Whānau quality of life	QALY loss = 10% of patient QALY loss (see Section 2.5 below)	Scope et al. (2022)
Productivity loss (treatment infusions)	Average 6.5 days unable to work per treatment cycle (applied to 54% who were working full-time prior to diagnosis)	2026 patient survey conducted by Roche N=41, mean age 54.9 years Roche data on file
Productivity loss (stem cell transplant)	Median 372 days 44% of patients having SCT	Estimated based on published research (see section 2.5 below)
Travel and accommodation needs and costs	See section 2.9 below	Various
Value of lost work time	$207 per day	Average employment earnings adjusted to reflect labour force participation and employment rates (Statistics NZ)
QALY value	$36,670*	Treasury CBAx ($36,670) base case, GDP per capita ($81,071) in sensitivity scenario (Infometrics 2025)

The CBAx QALY value is known to be low, as it is based on an annual average of the total number of QALYs associated with Pharmac's total investments in medicines. This means it reflects an average price paid per QALY, not a maximum willingness to pay.

Source: NZIER

2.4 Hospital and specialist doctor costs

We estimate hospital costs (costs of administering a treatment in a hospital setting) based on average bed hours and the number of cycles per treatment type and line supplied by Roche, and based on:

- Data from the POLARIX trial, which showed that:
  - R-CHOP and Pola-R-CHP patients have 1 induction cycle and an average of 4.2 maintenance cycles.
  - R-CHOP patients and Pola-R-CHP patients have an average of 4.2 maintenance cycles.

Table 10 below shows the implications for 1L bed hours from which some hospital costs are estimated.

Table 10 Average bed hours and cycles for existing and new 1L treatments

Based on average or expected patient experience

	R-CHOP	Pola-R-CHP
Induction: Cycle 1, Day 1	8 (Rituximab, slow rate)	9.5 (Rituximab, slow rate + 90min polatuzumab vedotin)
Average induction cycle hours	**8 hours8**	**9.5 hours**
Maintenance: Cycles 2-8	5 hours per cycle, average 4.2 cycles	4 hours per cycle, average 4.2 cycles
Average maintenance cycle hours	**21 hours**	**16.8 hours**
Total hours (induction + maintenance)	**29 hours**	**26.3 hours**

Bed hours include infusion and monitoring time.

Source: NZIER based on data from Roche

- Data from the STARGLO trial, which showed that:
  - R-GemOx patients received an average of 5.2 cycles (out of a planned 8 cycles, due to disease progression), consisting of:
    - One induction cycle involving infusions on days 1 and 2.
    - A total of 3.4 maintenance cycles, consisting of Rituximab + GemOx.
  - Glofit-GemOx patients received an average of 7.5 cycles, consisting of:
    - One induction cycle involving infusions on days 1, 2, 8 and 15.
    - 5.3 cycles of Glofitamab + GemOx
    - 1.2 cycles of Glofitamab monotherapy.

Table 11 below shows the implications for 2L bed hours from which some hospital costs are estimated.

Table 11 Average bed hours and cycles for existing and new 2L treatments

Based on average or expected patient experience

	R-GemOx	Glofit-GemOx
Induction cycle		
Cycle 1, Day 1	8 hours (Rituximab, slow rate)	10 hours (Obinutuzumab)
Cycle 1, Day 2	2.5 hours (GemOx chemotherapy)	2.5 hours (GemOx chemotherapy)
Cycle 1, Day 8	-	4 hours (Glofitamab step-up)
Cycle 1, Day 15	-	4 hours (Glofitamab step-up)
Average induction cycle hours	**10.5 hours**	**20.5 hours**
Maintenance cycles		(Average 7.5 cycles)
Cycle 2	5 hours (Rituximab + GemOx)	6.5 hours (Glofitamab + GemOx)

	R-GemOx	Glofit-GemOx
Cycles 3-8	4hours per cycle, average 2.4 cycles (Rapid Rituximab + GemOx)	4.5 hours per cycle, average 4.3 cycles (Glofitamab 2hrs + GemOx 2.5hrs)
Cycles 9-12	-	2 hours per cycle, average 1.2 cycles (Glofitamab monotherapy)
Average maintenance cycle hours	**14.6 hours**	**Glofitamab + GemOx cycles: 25.85 hours** **Glofitamab monotherapy cycles: 2.4 hours**
Total hours (induction + maintenance)	**25.10 hours**	**48.75 hours**

Source: NZIER based on data from Roche

Blood cancer patients are primarily treated by haematologists and other specialist doctors and nurses working within a multi-disciplinary team (MDT). While patients receiving regular treatment do not typically see a haematologist or other doctor at every treatment cycle, there will be:

- At least one specialist is involved in assessing the patient and explaining treatment prior to initiating any line of treatment.
- At least one MDT meeting in which the patient's care is discussed prior to initiating any line of treatment.
- At least one check on the patient by a specialist doctor during the initiation phase of treatment for monitoring.
- At least one check on the patient by a specialist doctor during the maintenance phase of treatment for monitoring.

These represent a conservative minimum for cost estimation: some patients are likely to see a specialist more often, and there may also be more frequent MDT discussions about their care.

Although MDTs can include many health professionals, we conservatively assume two specialist doctors in our cost estimates. A significant body of research has been published on the make-up, activity, and effectiveness of MDTs, and we draw on this evidence for our estimate of the average time spent discussing an individual patient (Mullan et al. 2014; Wihl et al. 2021).

We estimate the specialist doctor time required for each of these interactions based on the times in the table below.

Table 12 Doctor time involved in DLBCL treatment

Time use	Specialist doctor time per patient	Unit of measure
Face-to-face patient assessment and explaining treatment	30 minutes	per patient, per line of treatment
Multi-disciplinary team meeting (per patient)*	5 minutes x 2 doctors	per patient, per line of treatment
Brief check-in to monitor patient	10 minutes	per patient, per phase of treatment

*Based on the low end of the range identified in Wihl et al.(2021), which corresponds to above average but well within the upper end of 8 minutes per patient in Mullan et al. (2014).

Source: NZIER

2.5 Stem cell transplant costs

The cost of a stem cell transplant was estimated based on analysis undertaken by Roche, which included:

- cost estimates for the inpatient component of SCT therapy using Health NZ inpatient cost weights
- proportions of SCT inpatient events by complexity (25 percent major complexity, 42 percent intermediate complexity, and 33 percent minor complexity, based on observed AR-DRG separations)
- pre-transplant costs for consultations, diagnostic work-up
- mobilisation and medication costs
- costs and volumes of post-transplant monitoring through outpatient specialist visits.

Table 13 Costs associated with stem cell transplant

Phase	Component	Estimated cost
Pre-transplant	Consultation and work-up	$1,293.50
	Apheresis	$15,021.11
	Subtotal	**$16,314.61**
Transplant	Mobilisation	$101.03
	Inpatient stay	$87,514.78
	Supportive medication	$358.98
	Subtotal	**$87,974.79**
Post-transplant	Monitoring - 100 days	$4,140.00
	Subtotal	**$4,140.00**
Total cost of ASCT		**$108,429**

Source: Data supplied by Roche

The above costs include specialist doctor time, so we do not estimate this separately.

Productivity losses due to stem cell transplants

SCTs are notoriously hard on patients, as they involve intense, high-dose chemotherapy and sometimes radiotherapy as a “conditioning” phase before the new cells are introduced. This causes severe side effects and weakens the immune system, which remains suppressed for months. Common complications include chronic fatigue, pain, and weight loss, and many patients experience cognitive changes such as memory loss, difficulty concentrating, anxiety and depression. Due to these effects, many patients find themselves unable to work for several months to a year or more after the procedure.

A research study quantified the effects of SCT on productivity for DLBCL patients (Arboe et al. 2017), concluding that:

- at the time of the SCT, 44.4 percent were on sick leave from employment and expecting to return to work
- the median age of the patients on sick leave was 54 years (slightly lower than the overall median age of 58 years for all DLBCL patients undergoing SCT)
- median return to work time was 420 days
- within the first 2 years, 18 percent of patients who had taken sick leave to have the transplant were granted a disability pension, 8 percent withdrew permanently from employment (retired) and 25 percent died. The remaining 49 percent were still available for work or working.

To ensure our estimates are conservative, for SCT, we only include the patient’s and caregivers’ lost market productivity due to SCT, and we only include it for patients who did ultimately return to work. This is due to uncertainty regarding the reasons for non-return to work. We apply the same proportion to caregivers and assume they lose productive time equal to 30 percent of the productive time lost by patients due the particularly gruelling nature of SCT which increases the requirements for informal care.

Table 14 Productivity loss associated with stem cell transplants

	Calculation	Source
Median return to work time	420 days	Arboe et al. 2017
Working days per year	365 days in the year minus weekends (52*2 days) minus 4 wks annual leave (4*5 days) minus 12 public holiday days minus 10 sick days =219 days	According to Census data, the average work week is 37 hours ~ full-time work. New Zealand workers are entitled to 10 days of paid sick leave (which we assume are all used), 4 weeks of annual leave, and 11 public holidays plus one regional anniversary day.
Working days lost due to SCT	420/365 = 1.15 years 1.15 * 219 working days = 252 days 30% of this amount for caregivers	Calculated from above
Potential value of working days lost per SCT	252 days * $35 per hour *7hours =$65,268 (patient and caregiver)	Median hourly earnings and median hours per day from Stats NZ labour market statistics 2025 and Census 2023
Patients employed and intending to return to work after SCT	44% Assumed the same for caregivers	Arboe et al. 2017
Actual productivity loss per SCT	$65,268* 44% = $29,008 (patient) $65,628* 44% * 30% = $8,702 (caregiver)	Estimated

Source: As per table

2.6 Government tax and levy revenue

Based on the time out of work for SCT, we assume the productivity loss represents lost earnings, not simply absenteeism.

According to the Treasury, income tax and ACC levy paid on the average income amount to $19,073 per year. We apply this value to the amount of lost employment due to SCT.

2.7 Utilities in health states

Our modelling of the health outcome benefits of the new treatments is based on utilities provided by Roche. These are shown in the table below. The utility associated with not progressing to the next line of treatment is used to calculate the QALY gains associated with avoided 2L and 3L treatments.

Table 15 Quality of life associated with remission

Health state	Utility, while not progressed	Annual QALY gain from avoided progression to next line of treatment	Source
Remission after 1L treatment	0.795	0.795 – 0.750 = 0.045	Polatuzumab clinical trial data (supplied by Roche)
Remission after 2L treatment	0.750	0.750 – 0.728 = 0.023*	Polatuzumab clinical trial data (supplied by Roche)

*No value for the post-3L treatment utility while not progressed was available, so we assume the incremental QALY gain is half of the incremental QALY gain from avoiding 2L treatment.

Source: NZIER based on data supplied by Roche

The experience of treatment itself has a significant impact on quality of life. We factor this into our calculation of QALYs gained from avoided 2L and 3L treatments using the treatment-related QALY loss values supplied by Roche.

Table 16 Treatment related loss of quality of life

Treatment line	Treatment-related QALY loss	Application	Source
1L	0.020	Not used: No incremental effect	Roche
2L	0.125	Calculation of QALYs gained by avoiding 2L treatment (in year of treatment only)	Roche

Source: NZIER based on data supplied by Roche

A previous literature review by Pharmac and Auckland University in 2016 found that caregivers and family members of individuals with the disease have lower health-related quality of life than the general population. However, the scale of this loss depends on the disease type, the severity of the disease, and the burden of care that caring for the primary patient imposes on the caregiver. Despite this complexity, they still recommended that consideration be given to how this can be included more formally in economic evaluations (Gammie et al. 2016).

Applying some multiplier (typically 10 percent) of patient QALY losses to family has been used as a proxy measure in numerous health economic studies, particularly for chronic, severe, or infectious diseases such as Alzheimer's (for example, Scope et al. (2022)).

To ensure our estimates are conservative, we apply whānau QALY losses (or gains) only in the year of treatment. That is, we assume there are no long-term benefits to whānau quality of life.

2.8 Travel and accommodation costs

We estimated travel and accommodation costs for patients having treatment. The mean distance travelled is based on a published estimate indicating that the mean time to a secondary or tertiary hospital is 25.5 minutes (Brabyn and Skelly 2002). Accommodation costs (applied for the proportion of the population living rurally) are based on the National Travel Assistance accommodation reimbursement rate ($140 per night), and transport costs are based on Inland Revenue mileage rates.

Table 17 Travel and accommodation cost parameters

	Parameters	Sources
Travel costs	Mean distance: 34km one way Parking $10 Mileage: $0.35/km	Mean distance calculated from 25.5-minute travel time (source), assuming average speed of 80km/hr. Parking cost: Conservative estimate Mileage: IRD
Accommodation	15.7% of patients $140 per night	15.7% of patients living rurally (EHINZ 2024) Accommodation cost based on National Travel Assistance rates (ACC 2025)

Source: NZIER

2.9 Simplifying assumptions

Beyond the assumptions that form the scenarios described above, there are several key assumptions implicit in our analysis:

- We assume that there is no 3L treatment. That is, patients who relapse or become refractory to 2L treatment will receive palliative care.
- We assume, due to a lack of evidence, that patients who achieve remission from 2L treatment delay palliative care for two years only. This means the only palliative care cost savings are the value of two years of discounting.
- We assume, due to a lack of alternative evidence, that the population incidence of DLBCL grows at a rate of three percent per annum, which has been the growth in incidence observed for non-Hodgkins lymphoma in recent years. This implies that DLBCL remains at 53 percent of non-Hodgkins lymphoma cases.
- We assume, given the lack of alternative evidence, that the distribution of IPI scores in DLBCL patients remains constant over time.

2.10 Time horizon and discounting

We model the costs and benefits of the new treatments over a 20-year time horizon. This was selected due to the time it takes for treatments to deliver benefits and because of the transitional effects of a change in treatments. Relapse can occur many years after treatment, so the full benefit of treatments that reduce relapse rates can take many years to be realised. Survival gains and quality of life spread over remaining life years also require longer time horizons to capture fully. If funded today, it would be several years before the new treatments are fully adopted, and beyond that, the downstream impacts of earlier, less effective treatments would still be observed.

Because the time horizon of our analysis is long, we discount all monetised future costs and benefits at 3.5 percent per annum, consistent with Pharmac's approach.

2.11 Out of scope

There are four key out-of-scope items:

- The direct costs of medicines are out of scope for this report due to their commercial sensitivity. This means this report cannot be understood as presenting a value-for-

money assessment of the new medicines. Instead, this report provides an assessment of the value delivered by the medicines, which can be used to inform a value-for-money assessment.

- Costs associated with adverse events are excluded due to insufficient evidence.
- Private (patient and whānau) costs associated with seeking private care, particularly due to the unavailability of effective publicly-funded treatment, are excluded due to a lack of evidence.

3 Expected demand for first-line treatment®

3.1 DLBCL incidence

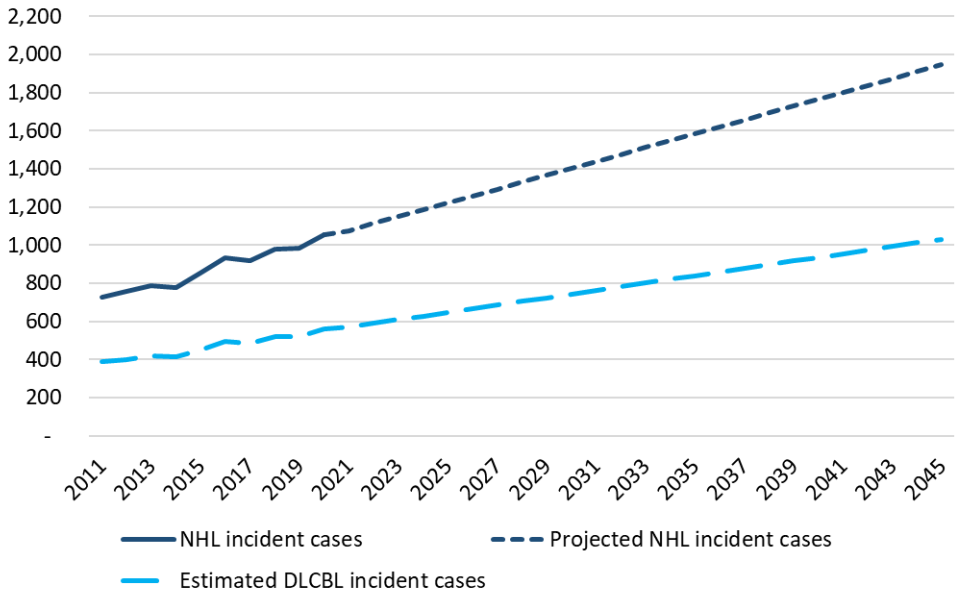
The incidence of DLBCL underpins the expected demand for 1L treatment.

According to data from Health NZ's Cancer Web Tool, there were between 383 and 614 new registrations of non-Hodgkins lymphoma between 2011 and 2020. Modelling supplied by Roche provided projected incident cases of non-Hodgkins lymphoma to 2030 based on observed historical growth rates, and indicated that the number of new registrations would reach 1,402 by 2030. We extended the projection out to 2045 to provide a 20-year time horizon for our analysis.

Middlemore Hospital registry data indicate that DLBCL patients represent 53 percent of non-Hodgkins lymphoma patients, and this is not expected to change. Therefore, we estimated the DLBCL incident cases through to 2045.

The underlying population with DLBCL is estimated to be approximately 666 in 2026, expected to rise to 839 by 2035 and 1,031 by 2045.

Figure 6 Incident cases of non-Hodgkins lymphoma and DLBCL
2011–2045



Source: NZIER

3.2 Eligibility for new treatments in the 1L setting

Pharmac's Cancer Treatments Advisory Committee (CTAC) recommended that Pola-R-CHP be funded for IPI 2-5 with a low priority, and for IPI 3-5 with a medium priority. As a result of this advice, the analysis in this report focuses on high risk (IPI 3–5) patients. These patients have a low 5-year overall survival of 33 percent to 55 percent with R-CHOP and will benefit from increased survival because of gaining access to this treatment. Patients with lower IPI scores will continue to be treated with R-CHOP.

According to data supplied by Roche, it is estimated that 44.7 percent of DLBCL patients have an IPI score between three and five.

3.3 Patients taking up 1L treatment

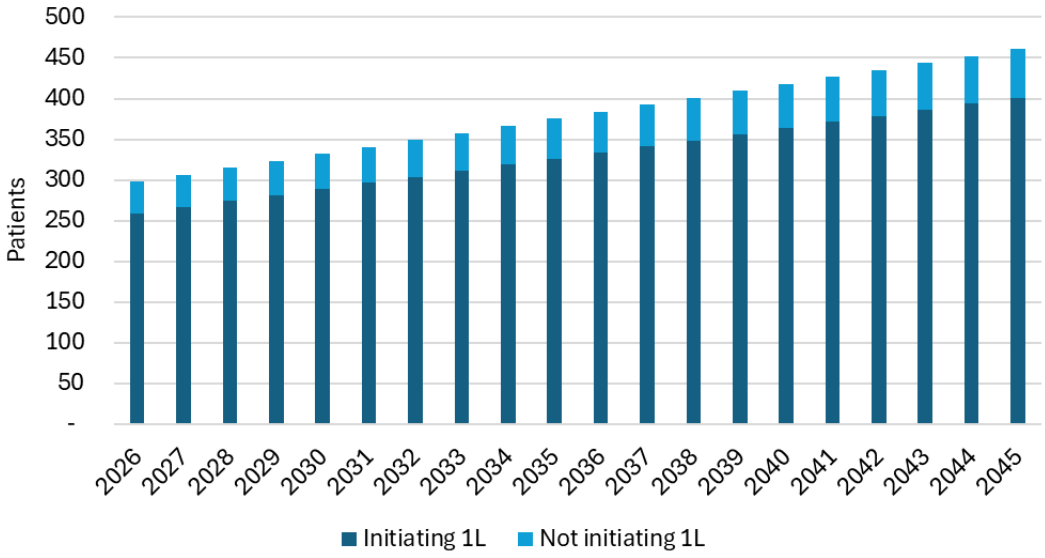
According to data from the Middlemore Hospital NHL database, approximately 87 percent of patients take up 1L treatment. An important caveat is that this rate represents uptakes for all patients, not just those with IPI 3–5. The main determinant of treatment uptake at diagnosis is immediate fitness rather than prognosis risk. There was no evidence indicating how immediate fitness varies across IPI groups to allow for further adjustment, so this rate is considered the best available estimate.

Applying this rate of uptake to the estimated number of incident IPI 3–5 cases suggests that:

- In 2026, 298 newly diagnosed DLBCL patients with IPI 3–5 would be diagnosed, of whom 259would receive 1L treatment with R-CHOP.
- By 2035, there would be 375 newly diagnosed DLBCL patients with IPI 3-5, of which 326 would receive 1L treatment with R-CHOP.
- By 2045, there would be 461 newly diagnosed DLBCL patients with IPI 3-5, of which 401 would receive 1L treatment with R-CHOP.

Figure 7 1L treatment choice in the counterfactual (R-CHOP only)

2026–2045, estimated for newly diagnosed DLBCL IPI3–5 patients



Source: NZIER

3.4 Introduction of new 1L treatment Pola-R-CHP

Because Pola-R-CHP is more effective in reducing the rate of relapse after 1L treatment, Pharmac's CTAC committee estimated a transition in the standard of care to Pola-R-CHP. On this basis, the analysis assumes uptake would reach 95 percent amongst patients having

1L treatment. However, that level of uptake may not be seen immediately. The uptake of the new treatment is modelled as follows:

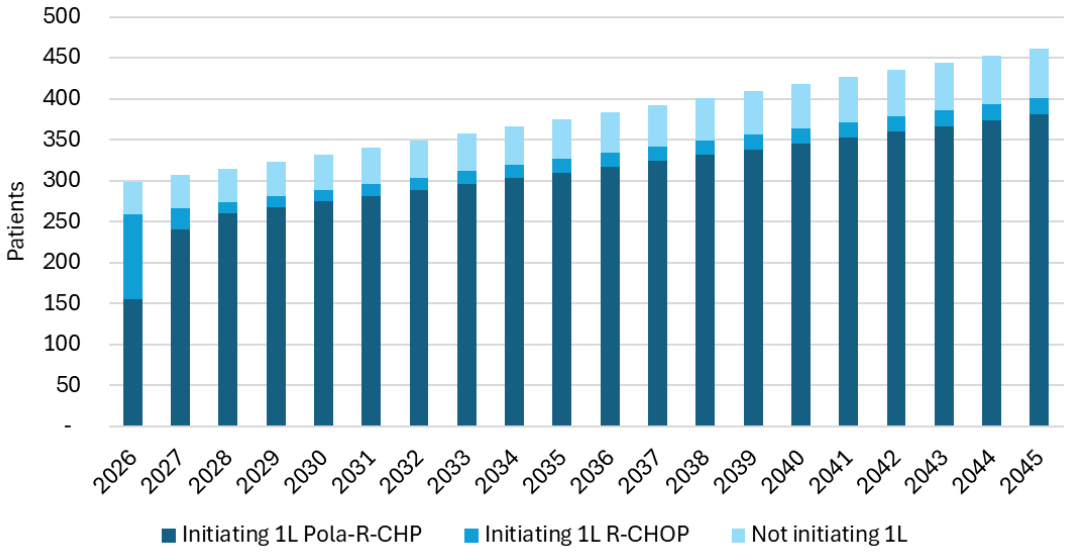
- 60 percent in 2026
- 90 percent in 2027
- 95 percent from 2028.

Based on these uptake rates, the number of patients receiving Pola-R-CHP as a 1L treatment grows rapidly from 155 in 2026 to 310 in 2035 and 381 in 2045.

Meanwhile, the number of patients receiving R-CHOP as a 1L treatment drops to a low of 14 in 2028 before slowly increasing with the DLBCL IPI-3-5 patient population over time.

Figure 8 1L treatment choice with availability of Pola-R-CHP

2026–2045, estimated for newly diagnosed DLBCL IPI3–5 patients



Source: NZIER

4 Expected demand for second-line treatment

Demand for 2L treatment is a function of the relapsed refractory (RR) rates from 1L treatment. Clinical trials data supplied by Roche describe the annual rate of progression to 2L treatment from 1L R-CHOP and 1L Pola-R-CHP over 22 years (including the year of 1L treatment).

These rates are shown in Table 18 below. Key features of the available data are that:

- the RR rate for 1L Pola-R-CHP is lower only for the first five years
- the RR rate is higher for Pola-RCHP from five years after treatment to nine years after treatment
- both 1L treatments have 0 percent RR rates from year 10 onwards.

This means that the benefits of Pola-R-CHP are positive until 4 years after treatment, then become negative, before falling to zero from year 10 onwards.

Table 18 Rates of progression to 2L treatment from 1L treatment

Year	Progression to 2L treatment from 1L R-CHOP	Progression to 2L treatment from 1L Pola-R-CHP
Year of 1L treatment	25.00%	15.00%
1 year later	18.75%	12.75%
2 years later	14.06%	10.84%
3 years later	10.55%	9.21%
4 years later	7.91%	7.83%
5 years later	5.93%	6.66%
6 years later	2.80%	5.66%
7 years later	0.00%	4.81%
8 years later	0.00%	4.09%
9 years later	0.00%	3.16%
10 years later to 21 years later	0.00%	0.00%

*Estimated based on proportionate difference in previous years.

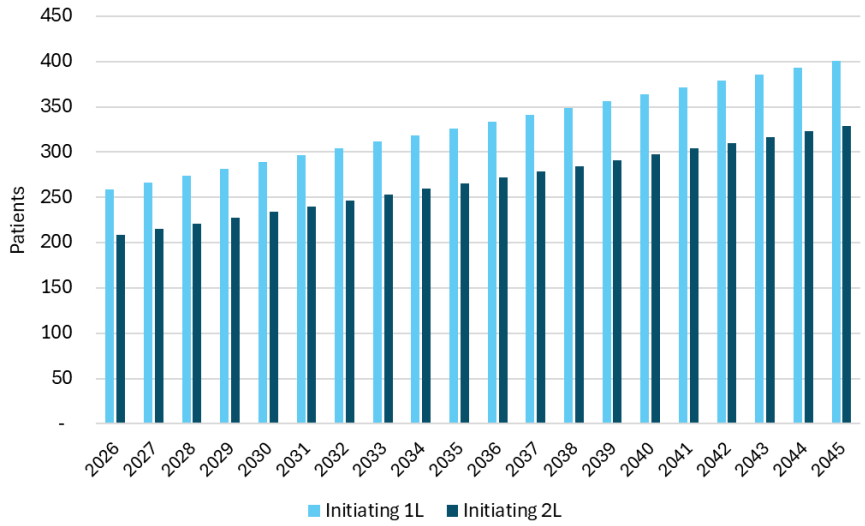
Source: NZIER

4.1 Progression to 2L treatment in the Counterfactual scenario

Based on the number of patients being treated at 1L with R-CHOP in the Counterfactual scenario, and projecting 1L treatment back from 2026 to allow for 2L treatments from 2026 onwards to reflect earlier 1L treatments, the number of patients initiating 2L treatment in the Counterfactual scenario rises from 209 in 2026 to 329 in 2045. In total, over 20 years, 5,377 people are expected to require further treatment following 1L treatment with R-CHOP.

Figure 9 Patients progressing to 2L treatments in the Counterfactual scenario

2026–2045



Source: NZIER

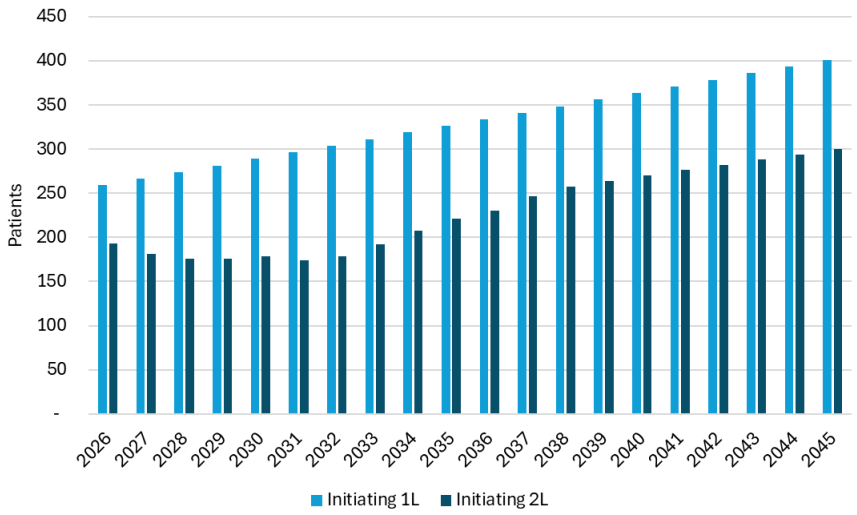
4.2 Progression to 2L treatment in the New Treatments scenario

After the uptake of Pola-R-CHP as a 1L treatment, fewer patients are expected to become refractory or relapse and require further treatment.

Based on the number of patients treated at 1L with R-CHOP and Pola-R-CHP in the New Treatments scenario, and projecting 1L R-CHOP treatment back from 2026 to allow for 2L treatments from 2026 onwards to reflect earlier 1L treatment, the number of patients requiring further treatment rises from 193 in 2026 to a high of 300 in 2045 after dropping slightly over the first five years in which the new treatment is available.

Figure 10 Patients progressing to 2L treatment in the New Treatments scenario

2026–2045

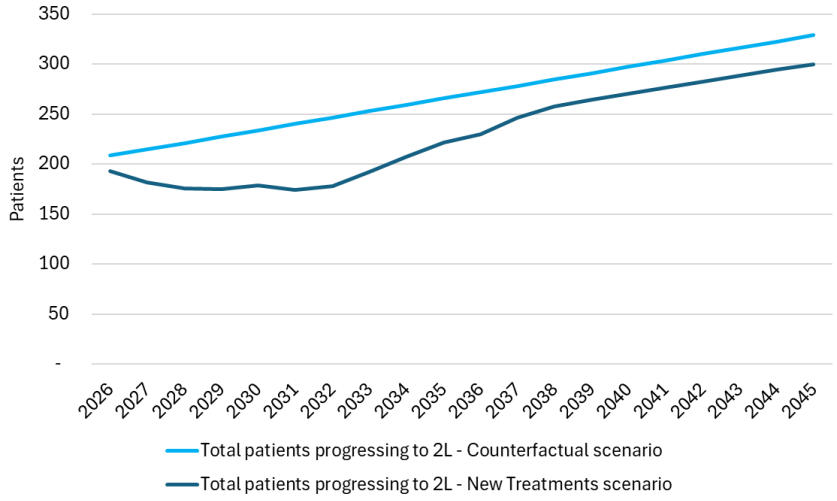


Source: NZIER

Comparing the two scenarios and combining all 2L treatments regardless of 1L treatment type shows that the number of patients proceeding to 2L treatment drops significantly in the New Treatments scenario.

Figure 11 Patients progressing to 2L treatment: Scenario comparison

2026–2045

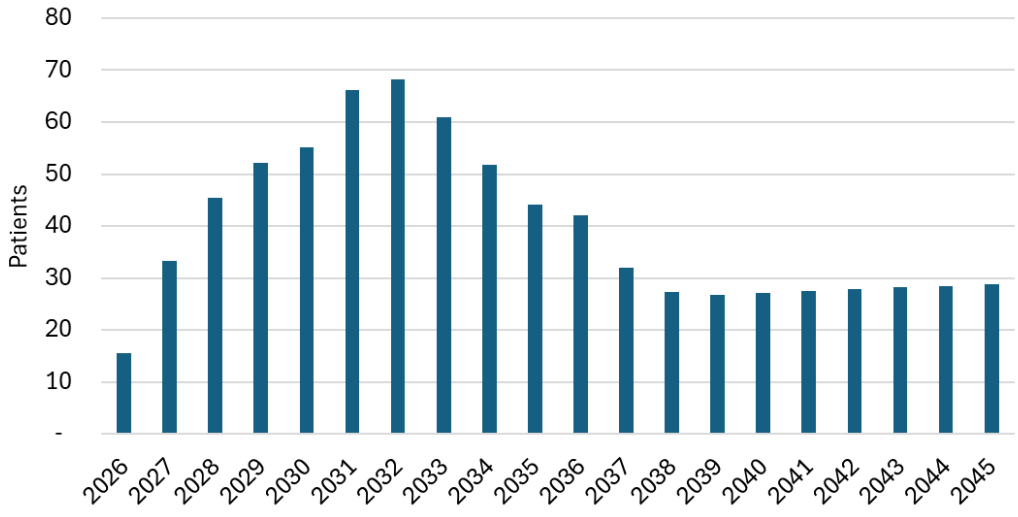


Source: NZIER

Figure 12 below shows the growth in the number of 2L treatments avoided in the New Treatments scenario. Starting in 2026, as patients begin taking up 1L Pola-R-CHP, the number of avoided 2L treatments grows from 16 patients in 2026 to 68 patients in 2032 before stabilising at a lower annual number, reflecting the lack of evidence on the longer-term benefits of Pola-R-CHP.

Figure 12 Number of patients avoiding 2L treatments in the New Treatments scenario

2026–2045

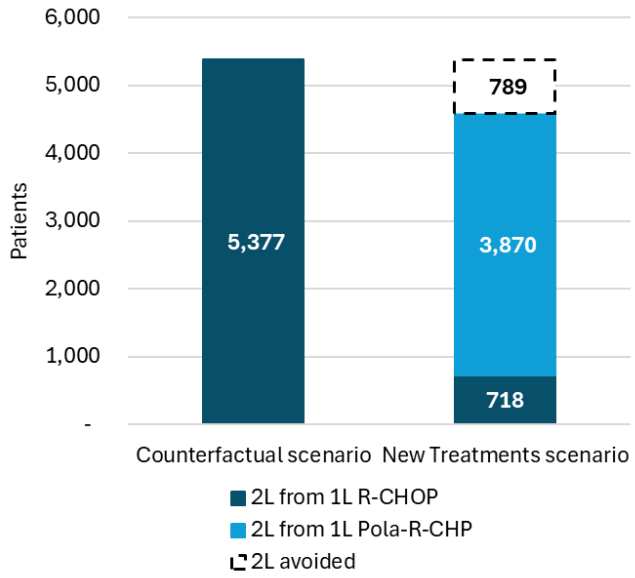


Source: NZIER

Over 20 years, the new treatment scenario sees a total of 789 New Zealanders avoiding becoming refractory or relapsing after 1L treatment, effectively being "cured" of cancer (see Figure 13 below).

Figure 13 20-year scenario comparison of patients progressing to 2L treatment

2026–2045



Source: NZIER

5 2L treatment patterns

Our analysis considers the following options for 2L treatment:

- 50 percent of patients progressing to 2L would have SCT in both scenarios.
- 50 percent of patients having SCT would not respond and would require treatment with either R-GemOx or Glofit-GemOx.
- In the Counterfactual scenario, 50 percent of patients progressing to 2L would proceed directly to R-GemOx, and another 25 percent of patients progressing to 2L would have 2L GemOx after not responding to SCT.
- In the New Treatments scenario, 50 percent of patients progressing to 2L would proceed directly to Glofit-GemOx, and another 25 percent of patients progressing to 2L would have 2L Glofit-GemOx after not responding to an SCT.

For this analysis, treatment with R-GemOx or Glofit-GemOx in patients who do not respond to an SCT is counted as a single line of therapy. Consequently, the total number of patients across 2L treatments exceeds the total number of patients progressing to 2L. This is due to 25 percent of patients progressing to 2L being counted in both the SCT numbers and the 2L chemotherapy numbers in both scenarios. This double counting is important for cost estimates since failed treatments incur costs to both the health system and the patient, but is removed from the estimation of long-term patient health benefits since failed treatments do not deliver these.

Based on the difference in RR rates following 1L treatment, the probability of SCT following 1L treatment, and the probability of requiring 2L R-GemOx or 2L Glofit-GemOx after failing to respond to SCT, the two scenarios show that over 20 years:

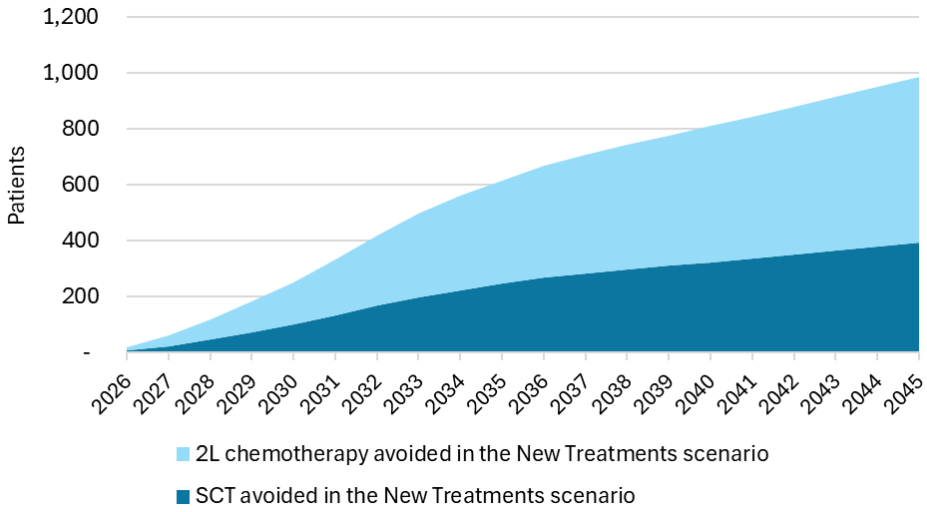
- The Counterfactual scenario leads to 2,689 patients having SCT and 4,033 patients being treated with R-GemOx as a result of 1L RR rates.
- The New Treatments scenario leads to 2,294 patients having SCT and 3,411 patients being treated with either R-GemOx (230) or Glofit-GemOx (3,211) as a result of 1L RR rates.

These results indicate that the 789 patients who avoid further treatment after 1L include:

- 591patients who avoid further chemotherapy
- 395 patients who avoid SCT (including 198 of whom would not have responded and would have also needed further chemotherapy).
- In total, therefore, the New Treatments scenario results in 987 treatments avoided by the 789 patients who are effectively cured of cancer after 1L treatment.

Figure 14 Patients avoiding SCT and 2L chemotherapy in the New Treatments scenario due to more effective 1L treatment

2026–2045

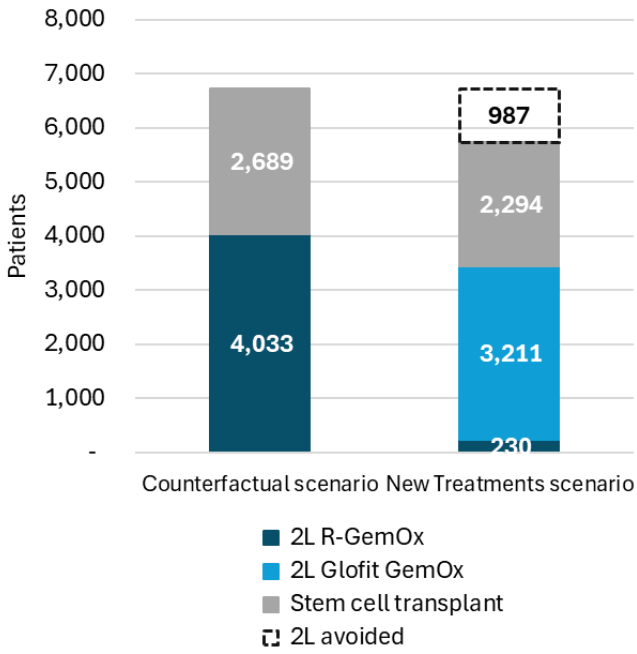


Source: NZIER

The overall number of patients treated with each type of treatment after progression from 1L is shown in Figure 15 below.

Figure 15 2L treatments and avoided treatments: Scenario comparison

2026–2045



Source: NZIER

6 Progression to palliative care

Sadly, for many DLBCL patients, even after 1L and 2L treatments, there can be news that there is no further hope of life-saving or life-extending treatment. For these patients, the next step is palliative care.

Data from clinical trials, supplied by Roche, provided 21 years of RR rates from 2L treatment with Glofit-GemOx only. To model this final stage for DLBCL patients, we used evidence from the STARGLO trial to estimate the RR rates from 2L treatment with R-GemOx.

The STARGLO trial showed that the RR rate from Glofit-GemOx for the subgroup of patients who had only had one prior line of treatment was 48 percent lower than for R-GemOx (see Table 19 below).

Table 19 Rates of progression to 3L treatment from 2L treatment with R-GemOx

Year	RR after 2L R-GemOx	RR after 2L Glofit-GemOx	RR after SCT
Year of 2L treatment	10.42%	5.00%	10.00%
1 year later	9.90%	4.75%	9.00%
2 years later	9.40%	4.51%	8.10%
3 years later	8.93%	4.29%	7.29%
4 years later	8.48%	4.07%	6.56%
5 years later	8.06%	3.87%	5.90%
6 years later	7.66%	3.68%	5.31%
7 years later	7.27%	3.49%	4.78%
8 years later	6.91%	3.32%	4.30%
9 years later	6.57%	3.15%	3.87%
10 years later	6.24%	2.99%	3.49%
11 years later	5.93%	2.84%	3.14%
12 years later	5.63%	2.70%	2.82%
13 years later	5.35%	2.57%	2.54%
14 years later	5.08%	2.44%	2.29%
15 years later	4.83%	2.32%	2.06%
16 years later	4.58%	2.20%	1.85%
17 years later	4.36%	2.09%	1.67%
18 years later	4.14%	1.99%	1.50%
19 years later	3.93%	1.89%	1.35%
20 years later	3.73%	1.79%	1.22%
21 years later	3.55%	1.70%	0.94%

Rates are rounded to 2 decimal places.

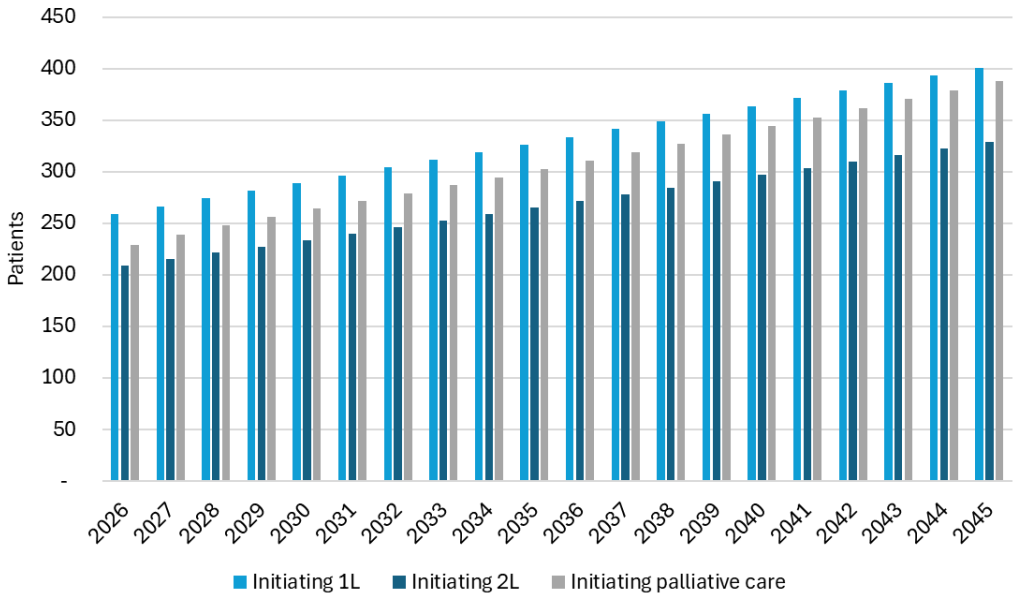
Source: NZIER based on data from Roche

6.1 Patients progressing to palliative care in the Counterfactual scenario

Based on the number of patients treated at 2L with R-GemOx or having SCT in the Counterfactual scenario, the number of patients proceeding to palliative care rises from 229 in 2026 to 388 in 2045. In total, over 20 years, 6,161 people are expected to proceed to palliative care in the Counterfactual scenario. On an annual basis, this amounts to a similar number of DLBCL patients initiating 1L treatment, highlighting the demoralising nature of caring for DLBCL patients, as noted in recent media articles (see, for example, Jones 2026).

Figure 16 Patients progressing to palliative care in the Counterfactual scenario

2026–2045, compared with patients initiating 1L and 2 L treatment



Source: NZIER

6.2 Progression to palliative care in the New Treatments scenario

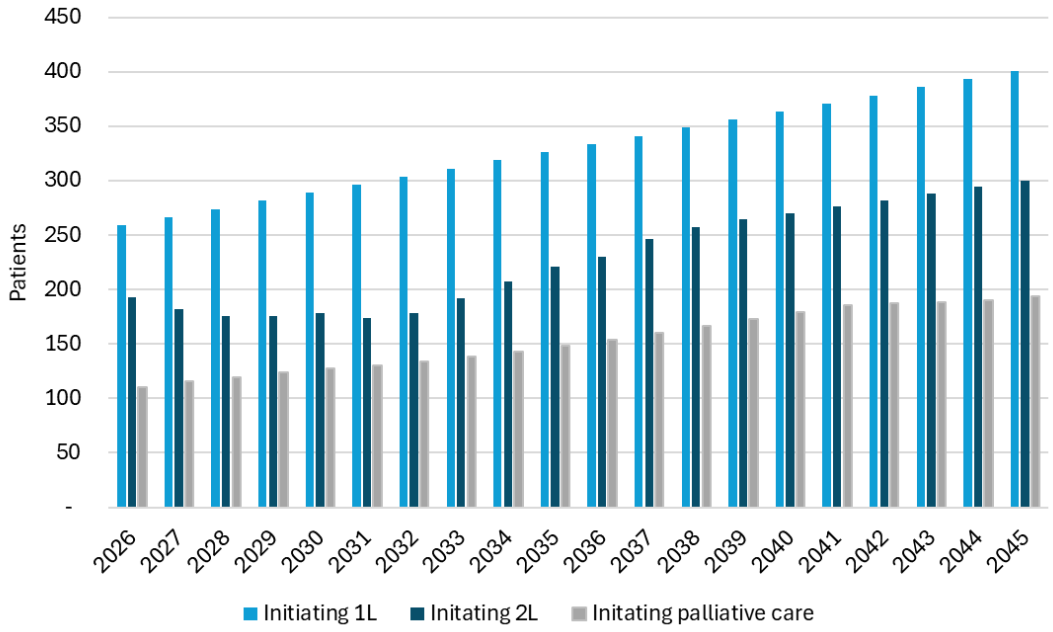
DLBCL patients who progress to 2L treatment have a considerably worse prognosis than prior to their 1L treatment due to the limited effectiveness of R-GemOx, especially for patients who relapse early, but Glofit-GemOx substantially changes this prognosis.

The New Treatments scenario, in which most patients requiring 2L chemotherapy are treated with Glofit-GemOx, results in significantly fewer patients requiring palliative care in the 20 years to 2045.

In total, over 20 years, 3,069 people are expected to initiate palliative care in the New Treatments scenario, making palliative care for DLBCL significantly less common than treatment and substantially fewer than in the Counterfactual, where 6,161 people face this scenario.

Figure 17 Patients progressing to palliative care in the New Treatments scenario

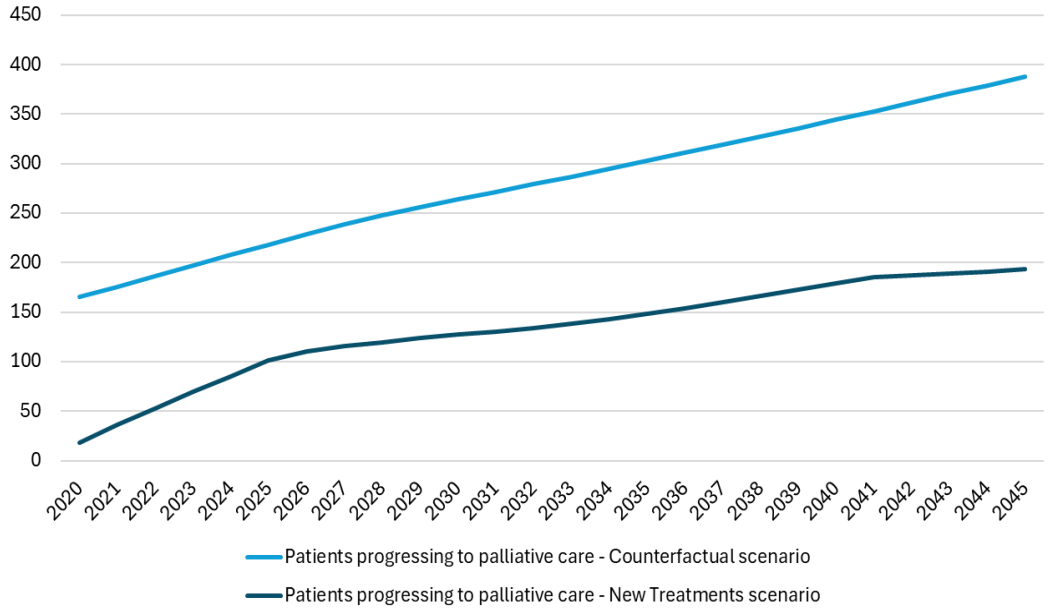
2026–2045, compared with patients initiating 1L and 2L treatment



Source: NZIER

Figure 18 Patients progressing to 3L treatment: Scenario comparison

2026–2045

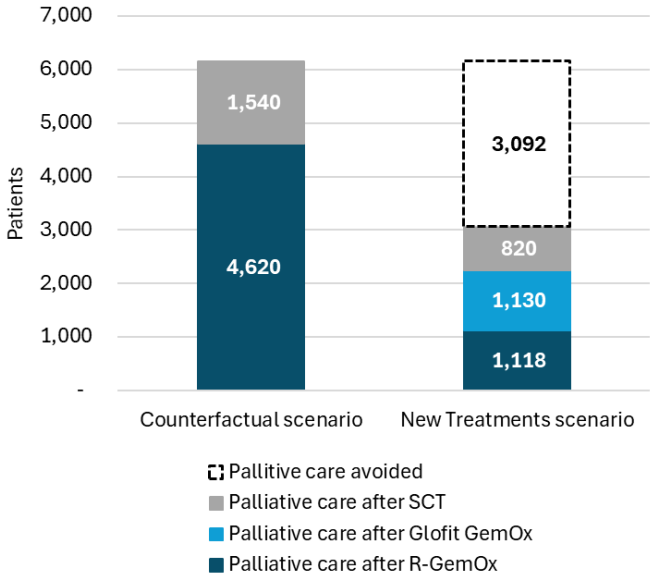


Source: NZIER

In total, over 20 years, 3,092 New Zealanders diagnosed with DLBCL would avoid or delay palliative care due to the new treatments available from 2026 (see Figure 19 below).

Figure 19 20-year scenario comparison of patients progressing to palliative care

2026–2045



Source: NZIER

7 What it means for the health system

7.1 Reduced demand for cancer treatment

Reduced demand for cancer treatment, where it can be achieved, is an important system enabler: Demand for cancer treatment is expected to rise significantly with population growth and population ageing. The State of Blood Cancer in New Zealand report notes that cancer services are operating under significant constraints, including (Blood Cancer NZ 2026):

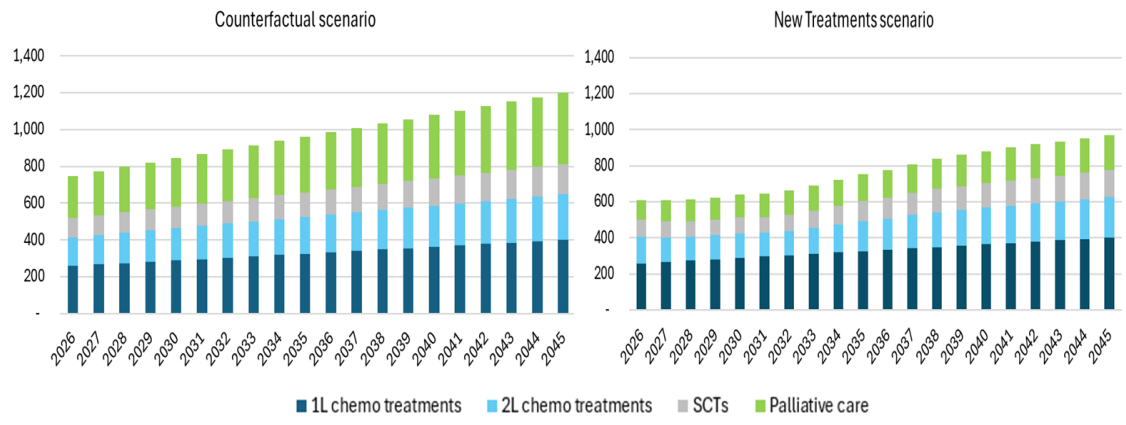
- workforce shortages across haematology and other specialist roles, including palliative care
- limited diagnostic capacity
- infrastructure gaps
- barriers to accessing medicines and clinical trials.

All of these can be alleviated by more effective prevention, earlier detection and more effective treatment, the latter being the most relevant for blood cancers, as opportunities for prevention and screening do not exist.

Following the introduction of the new treatments from 2026 in the New Treatments scenario, there is a substantial decline in the demand for 2L chemotherapy, SCTs, and palliative care (see Figure 20 below)

Figure 20 Demand for care: Scenario comparison over 20 years

2026–2045

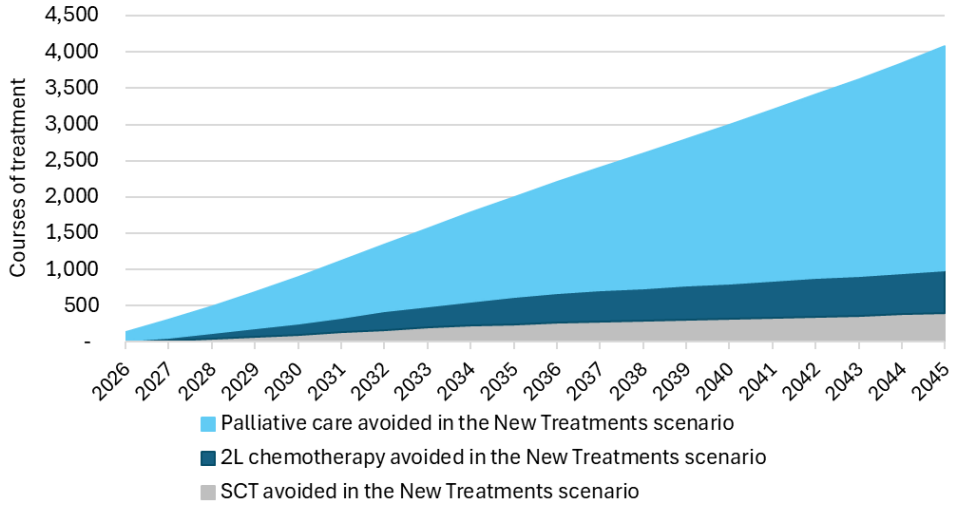


Source: NZIER

The differences in demand for care between the Counterfactual and New Treatments scenarios translate into a total of 592 episodes of 2L chemotherapy avoided, 395 SCTs avoided, and 3,092 entries to palliative care avoided over 20 years.

Figure 21 Cumulative 2L chemotherapy, SCT and palliative care avoided in the New Treatments scenario

2026–2045



Source: NZIER

This impact would be felt within the health system as a freeing up of resources used to deliver cancer treatments and care, enabling the system to better meet the growing need for cancer treatment and palliative care expected over the next 20 years due to population ageing and population growth. Below, we estimate the monetary value of these resources.

7.2 Health system cost impacts

We estimate health system savings based on the costs of hospital and specialist doctor inputs to SCTs, chemotherapy treatments, and palliative care.

Health system cost impacts from avoided SCTs

Although the number of avoided stem cell transplants is small (395 over 20 years), the estimated cost of these treatments is high at $1.08,429 per patient (see section 2.5). With 395 SCTs avoided over 20 years, the health system is expected to save $42.8 million, averaging approximately $2.1 million per year.

Health system cost impacts from chemotherapy treatments

Hospital and specialist doctor cost impacts from chemotherapy treatments were calculated based on:

- the number of patients treated with each line of each regimen in the Counterfactual and New Treatment scenarios
- the resources used (e.g. specialist doctor time, hospital bed time, nursing, administration, pharmacy and other hospital overheads) in each treatment regimen.

The New Treatments scenario results in fewer patients requiring 2L chemotherapy, but the use of hospital resources is different for the new treatments. The resources used to treat patients are a function of the number of treatment cycles and the number of bed hours per cycle. These are described in section 2.4.

To estimate hospital costs, we use a value of $150 per hour for bed time. This value was specified by Pharmac as including nursing and pharmacy costs as well as other overheads. We also include specialist doctor time at a value of $232 per hour (Treasury CBAx value); however, the only impact this has on total costs is through the avoidance of treatment, as we assume the same amount of specialist doctor time regardless of the chemotherapy regimen (one hour per line of treatment).

As shown in Table 20 below, there is a small amount of savings associated with a change from 1L R-CHOP to 1L Pola-R-CHP, but a substantial additional cost associated with a change from 2L R-GemOx to 2L Glofit-GemOx. Glofit GemOx nearly doubles the cost of 2L chemotherapy on a per-patient basis.

Table 20 Total and incremental hospital costs of chemotherapy treatments

	1L R-CHOP	1L Pola-R-CHP	2L R-GemOx	2L Glofit-GemOx
Total bed hours	29.00	24.80	25.00	48.00
Cost per hour	$150	$150	$150	$150
Total bed cost	$4,350	$3,720	$3,750	$7,200
Doctor time cost	232	232	232	232
Total hospital cost	$4,582	$3,952	$3,982	$7,432
Incremental cost		-$630		$3,450

Source: NZIER

As a result of the differences in chemotherapy costs and the changes in patient volumes, the New Treatments scenario results in:

- 1L chemotherapy costs of $26.4 million, compared with the Counterfactual scenario 1L chemotherapy costs of $30.2 million, for savings of $3.9 million over 20 years
- 2L chemotherapy costs of $24.8 million, compared with the Counterfactual scenario 2L chemotherapy costs of $16.1 million, for additional costs of $8.7 million over 20 years
- total chemotherapy costs of $51.1 million, compared with the Counterfactual scenario total chemotherapy costs of $46.3 million, for additional costs of $4.8 million over 20 years.

Palliative care

The cost of palliative care is substantial ($12,432 in 2026), and the New Treatments scenario sees a significant number of palliative care cases avoided over 20 years. The available evidence was insufficient to determine how long people delay palliative care, so we conservatively assume palliative care is delayed for only two years. This means the value of savings is a function only of the discounted cost of palliative care over two years, yielding a value of $614 per event.

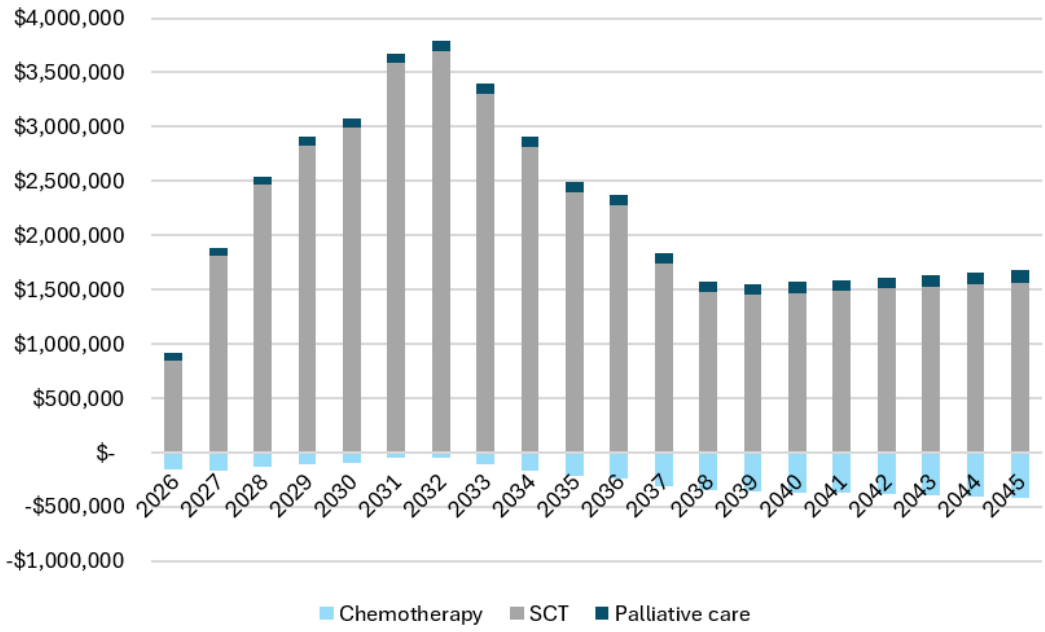
Based on the number of people avoiding palliative care each year and an assumed delay of two years in palliative care costs, the value amounts to nearly $1.9 million.

7.3 Total health system cost impact

Considering savings from avoided SCTs, additional chemotherapy costs, and savings from delayed palliative care, the total savings to the health system amount to $39.9 million over 20 years.

Figure 22 Health system cost savings over 20 years in the New Treatments scenario

2026 – 2045



Source: NZIER

After discounting at a rate of 3.5 percent per annum, the $39.9 million in cost savings to the health system over 20 years is equivalent to a present value of $30.6 million.

8 What it means for patients and whānau

8.1 The cancer journey and the impact of new treatments

Understanding the benefits of new cancer treatments requires a recognition of cancer as a "dread" disease and one that can cast a shadow over the lives of patients and their families for many years, even when treatment has been successful.

Nearly 1 in 5 blood cancer patients experience depression or anxiety, with rates up to 56 percent in newly diagnosed patients. Symptoms are driven by diagnosis shock, treatment side effects, financial strain, and uncertainty (Kuczmarski et al. 2022; Odejide et al. 2025). NHL and DLBCL patients' increased risk of depression and anxiety, as well as increased use of psychotropic treatments, are well documented in the published literature (see, for example, Tilch et al. (2022)).

New treatments with known improved effectiveness bring immediate benefits in terms of health outcomes for cancer patients as well as increased confidence and reduced anxiety about the future.

More patients are achieving remission

After treatment and before any recurrence of disease, patients whose treatment was successful are in remission. As time goes by, patients who remain in remission beyond the meaningful risk of relapse timeframe are considered "cured". Remission is the primary short-term objective of cancer treatment, and long-term remission – or cure – is the ultimate objective.

The proposed new treatments, including Polivy and Columvi, substantially increase the probability of achieving remission after 1L and 2L treatment for DLBCL.

"It was an amazing feeling, a relief. I didn't care that I had no hair."

(Blood cancer patient) (Leukaemia Care 2021)

Fewer patients are experiencing relapse

After achieving remission, celebration may be short-lived. One of the most significant sources of stress for cancer patients and their families is the fear of relapse. Relapse is a recurrence or return of the cancer after a treatment and a period in which the patient and their family hope to be able to look forward to a healthy, cancer-free life.

Relapse occurs when a small number of cancer cells survive initial treatment, remaining dormant before growing again. Recurrence can occur in the same location (local), nearby (regional), or in other parts of the body (distant) months or years later.

After 1L treatment, many blood cancer patients and their families experience worry and stress about relapse, especially around the time of check-ups and while waiting for blood test results (Leukaemia Care, n.d.)

"It is the quiet moments, when the world is still, that the fear creeps in. It is the 'what ifs' that threaten to unravel the peace I have fought so hard to find."

(Blood cancer patient)

Many interventions may reduce the fear and stress about relapse, including non-medical interventions like cognitive behavioural therapy (CBT); however, for many patients and their families, the knowledge that they have been treated with medicines that give them the best possible chance of avoiding relapse is the most reassuring factor. This is demonstrated time and again when new cancer medicines are funded, and patients gain access to what they know represents a better shot at survival.

Relapse for many blood cancer patients means an increased fear that this time the cancer is a death sentence (Leukaemia Care, n.d.). This fear is not unfounded: The prognosis for patients with DLBCL who relapse is poor, with a median survival of less than one year and less than half of patients who relapse are still alive at one year post-relapse (McMillan et al. 2016).

8.2 Avoided subsequent treatment due to the increased effectiveness of new treatments

Because the new treatments would be more effective at preventing relapse, more patients would be able to avoid further cancer treatment.

Returning for 2L treatment after relapse can be daunting for patients and their families. Often, the previous experience of treatment was unpleasant and stressful for the entire family, with disruptions to work and other aspects of family life. Treatment after relapse can mean more rounds of treatment, often with more intensive treatments that may come with more unpleasant side effects, more dependency on caregivers, and more stress for family.

"Stem Cell Transplant is brutal. I cannot even describe how brutal it was on me, on my wife bearing the load beside me, and it was almost more than my son could bear."

(Blood cancer patient, State of Blood Cancer in New Zealand 2026)

Because cancers often occur in older people, the experiences of children whose parents are having treatment are rarely discussed. The emotional experience of a parent's cancer may cause post-traumatic stress disorder (PTSD) and other long-term negative psychosocial outcomes for children (Egberts et al. 2022). Parents also often struggle with the decision to forego or reduce the quality of what may be a limited time left with their children in order to seek treatment with a small chance of success (Blood Cancer NZ 2025).

"Max didn't understand why Daddy was gone for a week every couple of weeks."

(Blood cancer patient's partner)(Blood Cancer NZ 2025)

8.3 Long-term health benefits from staying in remission

Of course, the main source of QALY gain is the quality and length of life expected for patients whose cancer is effectively "cured" by 1L treatment and for patients whose survival after 2L treatment is substantially extended. The annual gain is estimated based on progression-free survival.

The data to inform this analysis was supplied by Roche and describes the probability of patients being alive and in remission in each year after treatment, based on clinical trial data. This data allowed us to apply annual quality of life gains to individuals expected to remain alive in each year from the year of treatment to 20 years after treatment.

This means a flow of incremental QALYs over a long period of time. In total, over 20 years:

- New Zealanders who experience progression-free survival after 1L treatment gain a total of 591 QALYs.
- New Zealanders who experience progression-free survival after 2L treatment gain a total of 596 QALYs.
- Consistent with proportionate values suggested by published research, whānau experience a total of 119 QALYs because of these gains (see Section 2.5).

Data supplied by Roche included QALY loss associated with treatment. This indicated that all forms of treatment relevant to this analysis are associated with an equivalent QALY loss in the year of treatment: 0.125 QALYs. This is clearly conservative for SCT, given that qualitative evidence strongly suggests the treatment-related QALY loss would be greater than for chemotherapy.

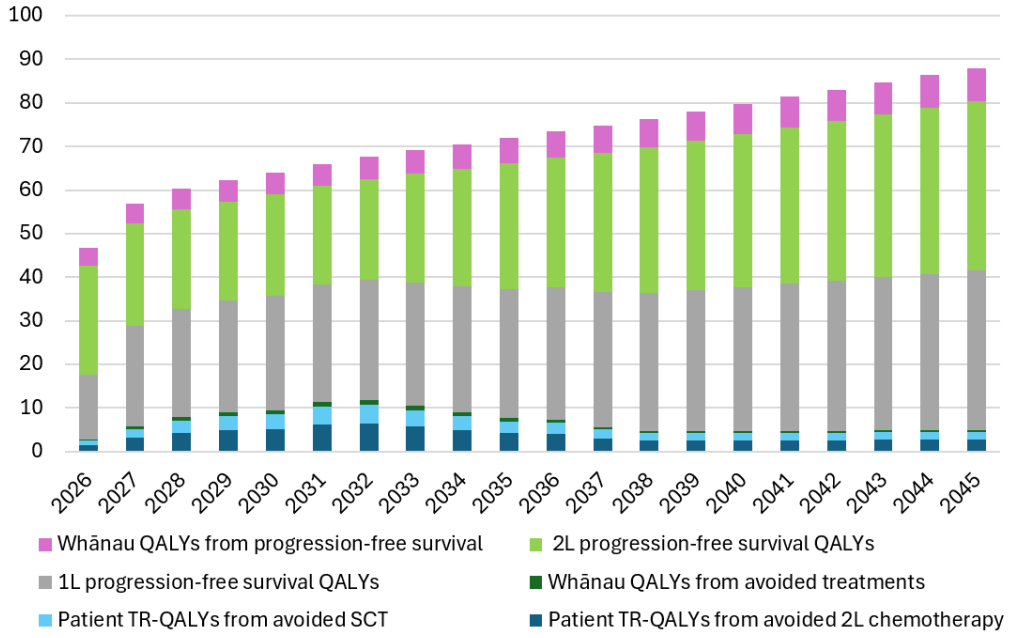
Consistent with published research (see section 2.5), we apply a 10 percent value of patient QALY impacts to estimate whānau QALY impacts in the year of treatment.

Based on 395 fewer patients having SCT and 592 people avoiding 2L chemotherapy, treatment-related QALY losses amount to 74.0 and 49.3 QALYs gained, respectively, with corresponding gains for whānau of 7.4 and 4.9 QALYs.

Figure 23 below shows how these QALY gains track over 20 years. In total, the New Treatments scenario delivers 1,442 additional QALYs to patients and whānau.

Figure 23 Total QALY gains due to progression-free survival in the New Treatments scenario

2026–2045



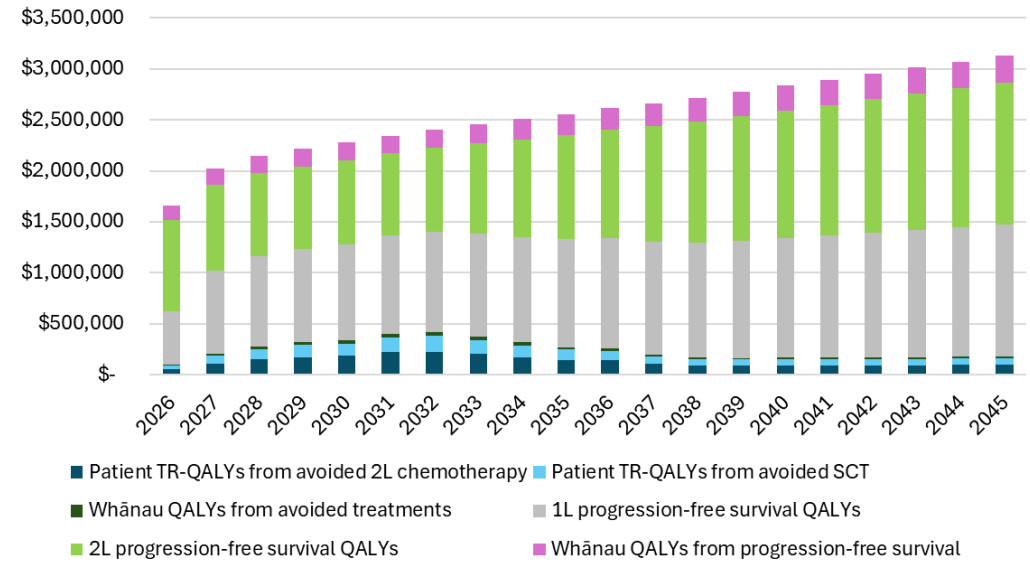
Source: NZIER

8.4 Total value of health impact for patients and whānau

In total, over 20 years, the additional QALY benefits of the New Treatments scenario are worth $51.3 million. Discounting at a rate of 3.5 percent per annum results in a present value of $36.7 million.

Figure 24 Total value of QALYs gained in the New Treatments scenario

2026–2045



Source: NZIER

8.5 The ability to work and support whānau

According to a survey of blood cancer patients conducted by Metis Healthcare Research for Roche (April 2026, not publicly available), patients are often forced to retire early, take prolonged breaks from work, or reduce their work hours because of their illness and/or the effects of treatment:

- 24 percent were retired despite a mean age of 54.9, and only 7 percent were retired prior to their diagnosis
- 54 percent report they were working full-time before the diagnosis, and this was reduced to 27 percent at the time of the survey
- those describing themselves as unemployed (not retired) rose from two percent to 20 percent, highlighting that some patients may be forced to give up employment and then struggle to return when they feel well enough
- overall 68 percent reported that the illness and/or treatment had a negative impact on their career or work.

SCTs are notoriously hard on patients, as they involve intense, high-dose chemotherapy and sometimes radiotherapy as a "conditioning" phase before the new cells are introduced. This causes severe side effects and weakens the immune system, which remains suppressed for months. Common complications include chronic fatigue, pain, and weight loss, and many patients experience cognitive changes such as memory loss, difficulty concentrating, anxiety and depression. Due to these effects, many patients find themselves unable to work for several months to a year or more after the procedure.

Valuing productivity impacts

Our estimation of the value of lost production involves two components:

- **Lost production associated with chemotherapy treatment cycles.** For many patients, this is the time when they feel least able to perform their usual daily activities and even require a caregiver to support them. Our estimate of this component of lost productivity is aligned with the survey finding that blood cancer patients are absent from work on average 6.5 days per month (based on patients who received treatment in the past two years).
  - We use the 6.5 day average per month as the amount of time that patients are absent from work and unable to perform unpaid work for each cycle of treatment.
  - We apply this estimate to the 54 percent of patients who report they were working full-time prior to their diagnosis.
  - We assume that due to the high level of activity limitation experienced by patients, all have a caregiver for half of this time. This is likely to include travelling with the patient to the hospital for treatment.
  - We apply average employment earnings to these estimates of worker absenteeism to derive a value for lost productivity. We apply these values to 1L, 2L, and 3L treatments (assuming 3L treatment has the same number of cycles on average as 3L treatment).
- **Lost production associated with SCT.** SCT results in significantly more lost productivity. We estimate productivity gains from avoided SCT based on a research study that

quantified the effects of SCT on productivity for DLBCL patients (Arboe et al. 2017). The study found that 44.4 percent of patients are on sick leave from employment when undergoing SCT and intend to return to work, and that the median time to return is 420 days. Based on these findings and New Zealand labour market data, we estimate that each SCT results in at least $29,008 of lost earnings and productivity for the patient and $8,704 lost earnings and productivity for the caregiver (see section 2.5).

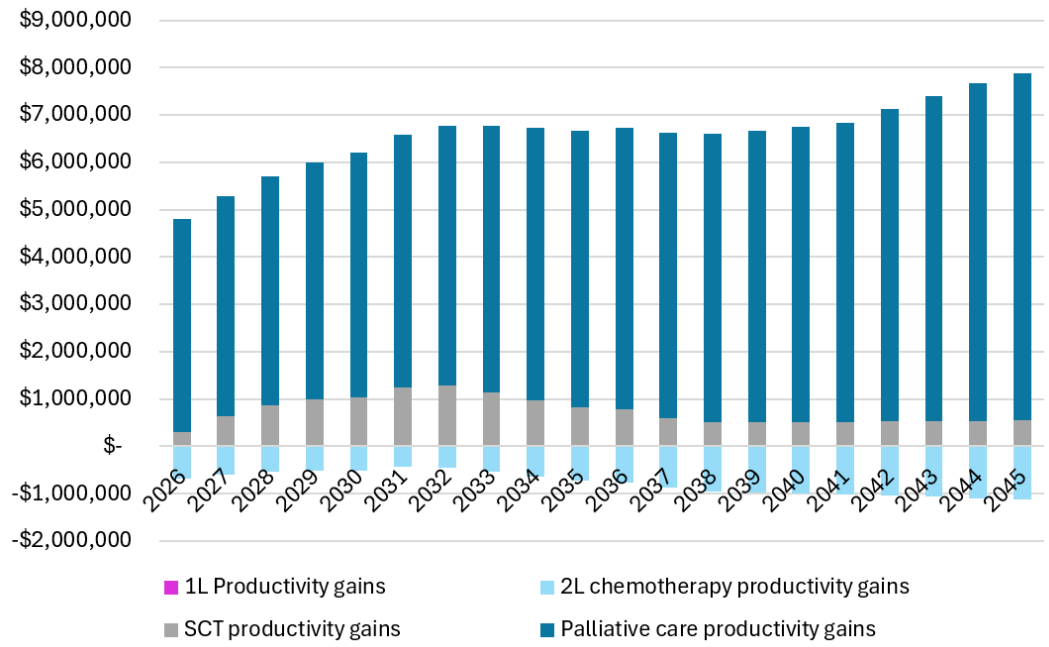
- **Lost production associated with palliative care and death.** A significant number of patients avoid palliative care in the New Treatments scenario. We conservatively assume that those who were employed prior to starting treatment (54 percent) gain only another six months of employment due to remaining in remission instead of going into palliative care.

Our results show that:

- There is no impact on productivity associated with 1L treatment.
- While there are productivity losses associated with 2L Glofit-GemOx due to the significantly higher number of cycles than for R-GemOx ($15.5 million over 20 years), the productivity gains associated with reduced need for SCT almost offset these ($14.9 million over 20 years).
- The main productivity gains come from people being able to work for an additional 6 months because of improved rates of progression-free survival ($116.3 million over 20 years).

Figure 25 Productivity gains due to new treatments

2026–2045



Source: NZIER

In total, over 20 years, productivity gains from the new treatments amount to over $142.0 million. After applying a 3.5 percent per annum discount rate, we estimate a 2026 present value of $103.8 million.

Treatments that extend and improve the quality of life offer a genuine possibility of longer-term productivity gains, even though we have not estimated these. For whānau, this can make a significant difference to their standard of living. The average age of DLBCL patients (54.9 years) suggests that many will have a partner who may be dependent on their income, and others may still have dependent children or children who are young adults and still stand to benefit from their parents' financial support. Even without paid work, the ongoing value people may contribute to their whānau and community in unpaid work, such as caring for grandchildren or volunteering, can be significant.

8.6 Tax revenue implications of productivity gains

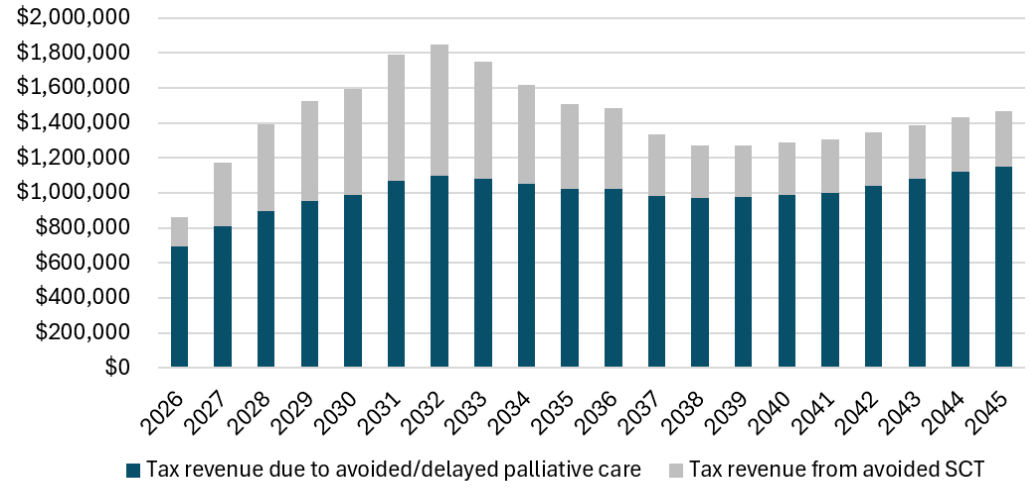
Some of the productivity gains we estimated are for employers – reduced absenteeism due to workers taking time off when they have chemotherapy. This was assumed because the number of days out of work is low.

However, patients who have SCT or would have gone into palliative care recover employment (if they were employed at the time).

Based on the income tax and ACC levy revenue for an average income earner, we estimate the tax implications of reduced SCTs and increased progression-free survival. The results indicate that the government would receive an additional $28.6 million in tax and levy revenue over 20 years. Discounted at 3.5 percent, this amounts to $21.0 million.

Figure 26 Additional tax revenue associated with productivity gains

2026–2045



Source: NZIER

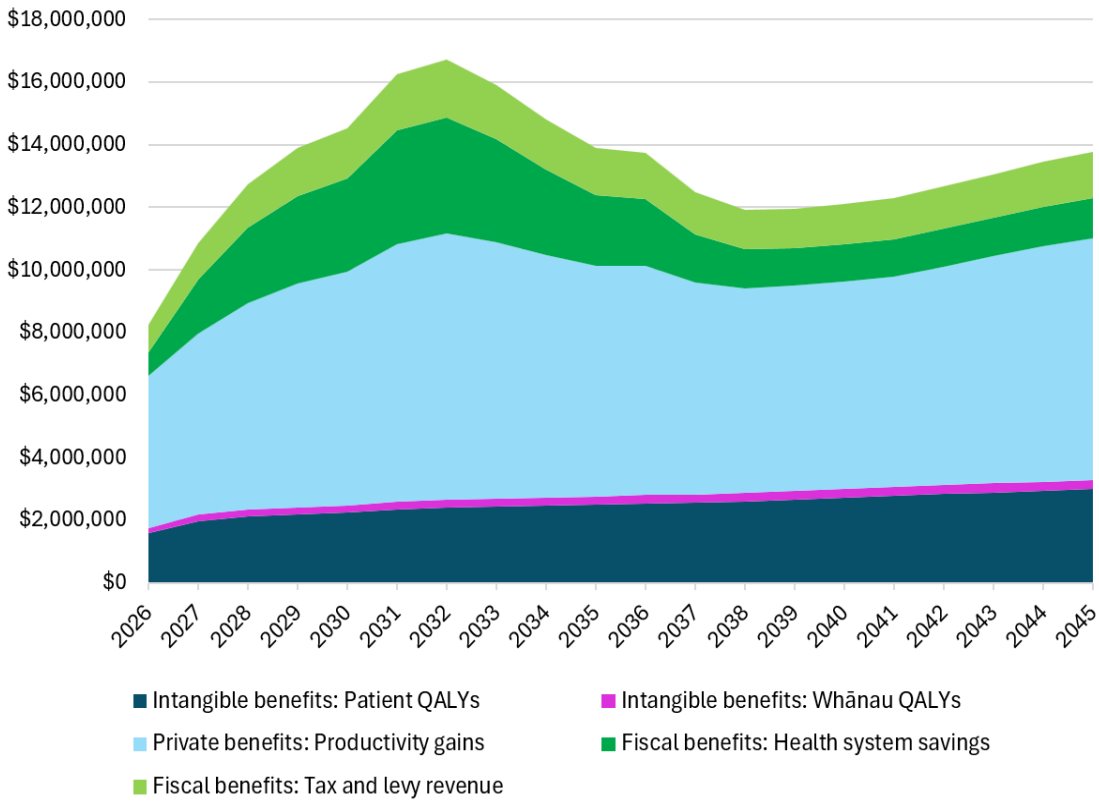
9 Summary of results

Figure 27 shows the annual value of cost savings and incremental health benefits estimated for the New Treatments from 2026 to 2045.

This diagram clearly highlights the relative importance of valuing not only the quality-of-life gains from the new treatments, which are a substantial contributor to overall value, but also valuing the health system savings from avoided treatments, which dwarf the quality of life gains in the first 10 years, and the additional value in recovered productivity, mostly due to SCTs avoided and avoided or delayed palliative care.

Figure 27 Value of incremental benefits of new DLBCL treatments

2026–2045, undiscounted



Source: NZIER

Over 20 years, these benefits amount to a value of $265.4 million, of which $68.5 million are fiscal benefits: health system savings and tax revenue.

With an annual discount rate of 3.5 percent, the present value of total benefits is over $194.7 million.

10 Limitations and other considerations

There are several important limitations to the analysis presented in this report, mainly related to areas where evidence is lacking. Our analysis is based on three levels of evidence:

Robust evidence from clinical trials

Our analysis considered what evidence shows will happen if the new treatments are introduced:

- More New Zealanders with DLBCL will be effectively "cured" of cancer – remaining in remission long-term and enjoying better quality of life and substantially longer lives.
- Fewer patients will need 2L chemotherapy treatment, and fewer will have stem cell transplants, reducing pressure on hospitals and specialist care, and saving them and their caregivers from the reduced quality of life that cancer treatment entails.
- Those who do need 2L treatment will benefit from extended survival, allowing them significantly more time, with all the value that time can offer, including being with whānau, the hope of new treatments, and the option of a dignified death of their choosing.
- Evidence suggests that up to half of DLBCL patients are working when they require treatment, so reduced treatment need translates into less absenteeism (spells associated with chemotherapy) and increased employment (reduced SCTs), translating into increased tax revenue for government.

Projections of evidence from clinical trials to capture likely long-term impacts

The evidence on the impacts of these new treatments is still emerging. This means it could be many years before the full value of the new treatments is known. While there is some uncertainty, subsequent follow-up studies of the STARGLO trial demonstrated that early survival gains were largely maintained. Our analysis is conservative because we use only the evidence currently available, suggesting that additional gains are likely.

Conservative assumptions reflecting likely patient and whānau impacts where direct evidence is lacking

Our analysis also considers the impacts that the new treatments could have for patients and whānau that are beyond what clinical trial evidence can inform. Impacts on patients and whānau, beyond health outcomes, are important considerations for medicines investment decisions. Our analysis includes:

- Estimated productivity losses for the patient are limited to 6.5 days for each cycle of chemotherapy treatment. This was based on the Roche patient survey that showed this affected 54 percent of patients.
- Estimated productivity losses for patients who have SCTs. This was based on previously published research demonstrating the devastating impact SCT has on employment for the 44 percent of patients who intend to return to work.
- Treatment-related QALY impacts for whānau to reflect that while patients are undergoing cancer treatment, whānau may experience stress and anxiety and bear an additional burden of care. The values we estimated were low due to limited evidence, but these impacts are important to recognise.

10.1 Our conservative approach excludes some impacts that may be significant

Conservative take-up rates mean estimated benefits are also conservative

We modelled a phased take-up rate of the new treatments (60 percent in 2026, 90 percent in 2027, and 95 percent from 2028 onwards). This assumption was conservative, reflecting uncertainty regarding take-up, despite Pharmac's CTAC expectation that the take-up of new medicines would be immediate.

Conservative assumptions about health system savings

The reduction in progression to 2L treatment achieved by Pola-R-CHP means many fewer patients incur the costs related to 2L treatment. We have only counted the health system costs related to chemotherapy cycles and the direct health system costs of SCT. We have excluded many other costs associated with cancer treatment, such as physiotherapy, mental health support and dietetic counselling. These costs are likely to be substantial, especially for patients who have more than one line of treatment. This means our model underestimates health system savings.

Long-term quality of life impacts for whānau are likely underestimated

While we include a value for quality of life impacts on whānau in the year of treatment (10 percent of patient treatment-related QALYs loss), we have excluded any lasting quality of life gains for whānau resulting from improved long-term health outcomes for patients. This almost certainly means we have underestimated the benefits to whānau of the new treatments. Relatedly, the quality of life benefits that whānau may receive from knowing their loved one has accessed more effective treatment and could access more effective treatment in the event of relapse may also be significant.

I feel for the trauma he (my son) felt coming so close to losing a parent and the strain of living in a cancer household.

(Blood cancer patient, State of Blood Cancer in New Zealand 2026)

Impacts of productivity focus short-term impacts and market production

Our analysis includes only productivity losses associated with the immediate effects of treatment and is limited to loss of market productivity for full-time workers (applied only to the 54 percent of patients who reported being in full-time work at the time of diagnosis for chemotherapy and the 44 percent who take sick leave from work to have an SCT).

In the absence of evidence, we also exclude long-term productivity losses, although it is likely that the experience of DLBCL leads to prolonged time out of work for some people, as well as pushing some people into early retirement.

This means loss of non-market productive time is excluded, which no doubt has important value to individuals and whānau, as this may include activities such as caring for children or grandchildren and other forms of unpaid domestic labour. A survey of DLBCL patients conducted by Roche showed that illness and treatment had a negative effect on:

- 73 percent of DLBCL patients' ability to do household cleaning

- 61 of DLBCL patients' ability to do gardening
- 59 of DLBCL patients' ability to prepare meals
- 51 percent of DLBCL patients' ability to do shopping
- 46 percent of DLBCL patients' ability to do household cleaning
- 39 percent of DLBCL patients' ability to do household cleaning, washing and ironing clothes.

These were the most reported unpaid work effects, but survey participants also reported negative impacts on caring for children or grandchildren (32 percent), caring for other household members (34 percent), and volunteer work (27 percent).

Out-of-pocket costs were excluded

The State of the Nation report also details the wider pressure carried by patients, whānau and the public system. Nearly half of patients report significant out-of-pocket costs, 69 percent draw on life savings to fund care, and one in seven spends more than $100,000 on unfunded medicines. In 2023, hospital-based blood cancer care cost nearly $209 million, while in 2024, people living with blood cancer accessed more than $56.3 million in social benefits.

We exclude travel and accommodation costs. It is well known that people in some New Zealand communities must travel long distances to access hospital-based care. Due to the absence of specific data on DLBCL patients, this would be considered an additional benefit for patients who avoid additional treatment because of the new, more effective treatments.

It is well acknowledged that New Zealanders have worse access to innovative, higher-cost medicines than citizens of other high-income countries, including Australia. Some New Zealand blood cancer patients travel to Australia for SCTs that are not funded in New Zealand. Data supplied by Roche suggests that SCT volumes are capped at around 25 percent of DLBCL 1L treatment patients, but we do not know whether this means that some patients miss out as a result. Some blood cancer patients travel to Australia to access other newer medicines – Daratumumab being one such example (RNZ 2025). This treatment costs $240,000 NZD per year (Myeloma New Zealand, n.d.).

The option value of time for people who have little time left is excluded and could be significant

Option values — referred to as Real Option Values (ROVs) in health economics — are distinct from QALYs. QALYs focus on measuring current health improvements, whereas option values measure *potential future opportunities* created by extending a patient's life. They are useful for describing the added benefit of a life-extending treatment by calculating the value of surviving long enough to access future potentially curative treatment.

Whereas QALYs measure the immediate, direct health benefits (length and quality of life) of a treatment, option values account for the additional value of keeping future treatment possibilities open, particularly in rapidly advancing fields like oncology. They are dynamic and forward-looking, rather than static and backwards-looking.

The closest analogy is 'options' in financial markets, where people pay for the right (but not the obligation) to pay for assets at set prices in the future, on the basis that they may rise in value.

Research indicates that including option value can significantly increase the calculated value of a treatment (Towse 2022). Studies have suggested a value of 10 percent for myeloid leukaemia and 25 percent for breast cancer (see, for example, Lakdawalla et al. 2018; Sanchez et al. 2012). Other studies have suggested that patients would be willing to pay about $35,000 for each 1-year increase in the standard deviation of survival, or up to 1 full year of average survival gain in exchange for increases in the variance of survival outcomes (Adjei et al. 2025).

"The first time I had cancer, CAR T wasn't an option. I am alive this time because of it. I get a second chance at being a mother to my four beautiful children, a wife to my incredible husband, a daughter, a sister, and a friend" (Blood cancer patient)
(Blood Cancer United 2026)

The National Institute for Health and Care Excellence (NICE) criteria for assessing life-extending end-of-life treatments explicitly acknowledge that the health gains from such treatments should be valued more than other health gains (McHugh et al. 2018).

Estimates of the value of options depend on a range of factors, including the rate or likelihood of innovation.

Over the last decade, approval of novel agents of various classes and mechanisms has dramatically changed the treatment landscape of R/R DLBCL, and a significant number of novel therapies are in development (Bhurke 2025). The emergence and continued development of new treatments in the relapsed/refractory setting suggest the treatment landscape is "changing quickly." (Nowakowski 2021, 284).

The right to die and the value of a dignified death

In New Zealand, terminally ill people who satisfy specific criteria have the option under the End of Life Choice Act to end their life on their own terms. Revealed preference theory tells us that because some people do take the option to end their lives, there is real value associated with having autonomy to control the timing, manner and place of death.

The assisted dying service has a strict process to determine eligibility. According to the Ministry of Health, the process from initial application through to determination of eligibility may take up to six weeks, and then the person needs to make arrangements. For many people, the process will involve talking to whānau about the decision, and this can also take time. This means that for DLBCL patients who may not get long-term benefits from the new treatments, even a few more months of survival can make the difference.

The number of people choosing to end their lives in New Zealand is steadily growing (Ministry of Health 2025a). Between April 2024 and March 2025, 472 people successfully opted to end their lives (a 37 percent increase on the year before). Most were 65–84, and most made this choice rather than to continue living with and die from cancer (62 percent). It is reasonable, then, to assume that some people with RR DLBCL will choose this option, and the ability to make this choice because of an extended period of time to complete the process has real value.

11 Conclusions and recommendations

This analysis provides a clear picture of the potential benefits of introducing new treatments for DLBCL compared with the current standard of care. The counterfactual is not neutral. Without change, patients will continue to experience high rates of relapse, repeated treatment, and poor survival outcomes, with ongoing pressure on the health system and significant impacts on whānau.

Introducing new treatments fundamentally shifts this trajectory. Fewer patients progress to later lines of treatment, survival improves, and the burden of disease is reduced. These effects compound over time, resulting in substantial reductions in treatment demand, improved quality of life, and wider economic and social benefits.

The results highlight the nature of the investment decision. The benefits are not immediate but build over time as treatment pathways change and fewer patients relapse. This creates system-wide effects, including reduced pressure on hospital resources and improved capacity to deliver care elsewhere. And while there is uncertainty, particularly in projecting long-term outcomes, the overall direction of impact is clear. The analysis is conservative in many respects and does not capture all benefits, especially those experienced by patients and whānau. Delaying access, therefore, carries a real cost in terms of avoidable harm and foregone gains.

Taken together, the findings support a broader approach to decision-making. This includes considering long-term outcomes, system impacts, and the value of improved survival and quality of life alongside clinical evidence.

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Appendix A Polivy Consumer Panel

Polivy® (polatuzumab vedotin), 140mg and 30mg vials, is a **Prescription Medicine** used to treat a type of cancer called diffuse large B-cell lymphoma (DLBCL). It is used when the cancer has never been treated before; when the cancer has come back or has never responded to one or more previous treatments for this type of cancer; and when you cannot receive a stem cell transplant

Ask your doctor if Polivy is right for you.

Polivy is an unfunded medicine for DLBCL. Ask your health professional about the cost of the medicine and other fees that may apply.

Use only as directed. If symptoms continue or you have side effects, see your healthcare professional. For more information about Polivy:

- talk to your health professional; or
- visit medsafe.govt.nz for Polivy Consumer Medicine Information; or
- visit roche.co.nz or call Roche on 0800 276 243

Polivy has risks and benefits.

Tell your doctor immediately or go to your nearest Accident and Emergency Centre if you notice any of the following signs and symptoms:

During an infusion: swelling of your face, lips, tongue or throat with difficulty breathing; swelling of other parts of your body such as your hands or feet; shortness of breath, wheezing or trouble breathing; abnormal or irregular heartbeat; rash, itching or hives on the skin; flushing (warm, red) skin; pain or swelling at site of injection; burning or tingling sensation, tenderness and redness at site of injection; blistering or ulceration at site of injection; feeling sick (nausea) or vomiting, diarrhoea; pain or discomfort (including stomach pain, back pain, chest or neck pain); fever or chills. **After an infusion:** flu and/or cold-like symptoms, chest pain, coughing, sweating; fever, sore throat, tiredness, sores in the mouth or gums; bruising, bleeding gums or nose, rash on legs with red dots, blood in urine or stools; numbness or tingling in the hands or feet, sharp or jabbing pain, burning or freezing sensation, pins and needles; weakness, lack of energy, feeling unsteady; difficulty walking; muscle cramps or spasms, heart palpitations, breathing difficulties, mood changes; swelling of the hands or feet, yellow skin or eyes, rapid heartbeat, appetite changes; confusion or memory loss, muscle spasms and cramps, facial twitching, numbness; nose bleeds, feeling dizzy, tired, looking pale; nausea or vomiting; constipation or abdominal pain; diarrhoea; rash, itching or hives on the skin; decreased appetite, weight decrease; changes in blood tests; dry skin, skin infection; urinary tract infection; upper respiratory tract infection; breathlessness and difficulty in breathing.

Other side effects not listed above may also occur in some people.

Do not use Polivy if: you have an allergic reaction to polatuzumab vedotin or any of the

ingredients in Polivy.

Tell your doctor if: you have ever had nerve problems such as numbness, tingling in the hands or feet or eyesight problems; you have ever had liver problems such as hepatitis; you think you may have an infection. **Pregnancy/Lactation;** you are pregnant or breastfeeding or plan to become pregnant whilst taking Polivy.

Panel dated 06 Jan 2026.

Appendix B Columvi Consumer Panel

Columvi® (glofitamab), 2.5 mg/2.5 mL and 10 mg/10 mL vial, is a **Prescription Medicine** used for the treatment of adults with diffuse large B-cell lymphoma (DLBCL). It is used when the cancer has come back (relapsed) or the cancer did not respond to previous treatments.

Ask your doctor if Columvi is right for you.

Columvi is an unfunded medicine for relapsed or refractory diffuse large B-cell lymphoma. Ask your health professional about the cost of the medicine and other fees that may apply.

Use only as directed. If symptoms continue or you have side effects, see your healthcare professional. For more information about Columvi:

- talk to your health professional; or
- visit medsafe.govt.nz for Columvi Consumer Medicine Information; or
- visit roche.co.nz or call Roche on 0800 276 243.

Columvi has risks and benefits.

Possible common side effects include: Reduced levels in blood tests of: neutrophils or lymphocytes (types of white blood cell), which may cause fever or symptoms of an infection; red blood cells (anaemia), which may cause tiredness, feeling unwell and pale skin; platelets (a type of blood cell), which may cause unusual bruising or bleeding; low levels in blood tests, phosphate, magnesium, calcium or potassium; low sodium levels in blood tests, which may cause tiredness, muscle twitching or cramps; increased levels in blood tests of liver enzymes and bilirubin (yellow substance in blood), which may cause yellowing of skin or eyes, and dark urine; fever; rash; headache; new or recurring viral infections, such as lung infection, shingles or cytomegalovirus; bacterial infections, such as urinary tract infection; infection in or around the stomach; respiratory tract infections, such as runny nose, sore throat, sinus infections, and chest colds; lung infection (pneumonia), which may cause fever, cough, and difficulty breathing; infection in blood (sepsis), which may cause fever, chills and confusion; fungal infection; COVID-19 infection caused by a virus called coronavirus (SARS-CoV-2); fever with low levels of neutrophils; constipation; diarrhoea; feeling sick (nausea); vomiting; bleeding in the stomach or gut (gastrointestinal haemorrhage), which may cause black stools or blood in vomit; abdominal (belly) pain; inflammation of the large bowel, which may cause abdominal pain, bloody stools and the urge to have a bowel movement; confusion; trembling; sleepiness; pain in muscles or bones; numbness, tingling, a burning sensation, pain, discomfort or weakness and /or difficulty walking (peripheral neuropathy); inflammation of the pancreas.

Do not use Columvi if: you are allergic to glofitamab or any of the ingredients in Columvi.

Tell your doctor if: you have any other medical conditions or take any other medicines. **Pregnancy/lactation:** tell your doctor if you are pregnant or plan to become pregnant or are breastfeeding.

Tell your doctor immediately or go to your nearest Accident and Emergency Centre if you notice any of the following: Cytokine release syndrome: symptoms include fever, fast

heartbeat, feeling dizzy or lightheaded, chills, shortness of breath, fever with low levels of neutrophils (a type of white blood cell). **Neurologic toxicity including ICANS**: symptoms include confusion, disorientation, sleepiness, or change in consciousness level. **Infections:** symptoms include fever, chills, difficulty breathing, burning pain when passing urine. **Haemophagocytic lymphohistiocytosis:** symptoms include fever, enlarged liver and/or spleen, lymph node enlargement, easy bruising, kidney abnormalities, and breathing problems. **Tumour flare:** symptoms include your cancer appearing to become worse, developing tender swollen lymph nodes, chest pain, cough, inability to breathe easily, or pain at the site of the tumour. **Tumour lysis syndrome:** symptoms include weakness, shortness of breath, feeling confused, irregular heartbeat, muscle cramps. **Gastrointestinal/digestive system:** symptoms include inflammation of the large bowel, which may cause abdominal pain, bloody stools and the urge to have a bowel movement.