



AUSTRALIAN COMPETITION
& CONSUMER COMMISSION

Regulation Impact Statement – Proposed mandatory safety standard on non-refillable helium cylinders

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Regulation Impact Statement – Proposed mandatory safety standard on non-refillable helium cylinders

This Regulation Impact Statement (RIS) sets out the Australian Competition and Consumer Commission's (ACCC) responses to the seven Regulation Impact Statement (RIS) questions from the *Australian Government Guide to Regulatory Impact Analysis 2020* (the **Guide**). This RIS will be used to inform a final decision by the Minister for a new mandatory safety standard for non-refillable helium cylinders.

Background

The ACCC is responsible for promoting consumer safety and administers product safety laws designed to ensure consumer products are safe. The ACCC is responsible for administering and enforcing mandatory consumer product safety and information standards under the Australian Consumer Law (ACL). Mandatory safety standards are one means of promoting consumer safety and are introduced when deemed necessary to prevent or reduce the risk of injury (or death) to a person. The ACL provisions on safety apply to both the intended use of consumer products and their foreseeable misuse, including deliberate misuse.

1. What is the problem you are trying to solve?

The hazard

Helium is a colourless, odourless, and tasteless gas that is used in a variety of functions including in car airbags, high-tech equipment, medical and scientific research, and gas for aircraft. One of its most popular uses is for balloons and other inflatable decorative items for events, functions, and parties.

Helium is supplied to consumers in containers for filling balloons and other objects for entertainment and recreational purposes. When used as intended, helium in this form is safe. However, helium cylinders are also misused as a means to suicide. Unfortunately, these cylinders are promoted as a means of assisted suicide as they are readily available for purchase, inexpensive and considered an effective and a relatively painless means of achieving this outcome. Despite prominent warnings to the contrary the loss of life associated with this misuse has not reduced over time and warnings and education have not been sufficient to reduce the level of deaths.

The deliberate inhalation of helium gas is harmful and can cause illness, with prolonged use leading to death by asphyxiation. This is because when inhaled the helium gas displaces oxygen which rapidly leads to unconsciousness and death if the exposure continues. Suppliers are already aware of the dangers posed by these cylinders with the majority including information on their websites and providing warnings that the product is not to be inhaled.

Deaths from suicide by asphyxiation of helium by misuse of balloon kits occur in Australia and overseas. As detailed below helium cylinders have been used as a means to suicide on 418 occasions between the years 2000 and 2018. This intended misuse has previously been raised with the ACCC by various Coroners. Between 2016 and 2021, the Victorian, Queensland and ACT Coroners wrote to the ACCC on 17 occasions to notify of asphyxiation deaths caused by the deliberate inhalation of helium gas and to recommend that the ACCC introduce a mandatory standard to regulate non-refillable helium cylinders to address suicides from these products. 11 of these coronial correspondences have occurred since 2018. When raised with suppliers during discussions about a proposed regulatory response,

suppliers have previously indicated their concern that their products are being used frequently for this purpose.

Helium used in the floatation of balloons has also resulted in accidental adverse outcomes such as the death of an 8-year-old boy in the UK after inhaling helium gas from a balloon bought for his birthday a week earlier. Although the child accessed the helium from an already filled balloon rather than from a non-refillable cylinder it indicates the danger posed by this gas when inhaled.

Non-refillable helium cylinders are sold to the general public in retail environments in bricks and mortar establishments such as general retailers and party supply shops and online and are promoted as a fun party product. They are supplied either as part of a balloon kit which consists of a non-refillable cylinder of pressurised, concentrated helium gas and associated balloons, and ribbons. They are sold in 2 sizes (small or large), are inexpensive and retail for approximately \$60-\$80 per kit. People use the cylinder to inflate balloons for decorative purposes with the balloons remaining inflated for around 8 – 12 hours. Cylinders are also sold through the same supply channels individually without balloons or ribbons.

Non-refillable helium cylinders filled with helium balloon gas are a component of the broader party balloon market, which includes latex and foil party balloons in commercial and residential settings.

Helium balloon kits are also available as small refillable cylinders from major producers and distributors of industrial gases as well as from party supply stores. These cylinders are not available from high street retail establishments. Our research indicates that purchasing or renting these products requires the customer to either establish an account with the supplier and/or provide identification. Additionally, renting these cylinders requires the customer to provide a deposit of around \$200. The different supply profile of these cylinders means that although these cylinders may be used as a suicide, a review of coronial data indicates that they have not been used to date as a means of suicide. It would appear that the heightened barriers to access these cylinders provides a deterrent at this time. Therefore, regulatory intervention is not considered necessary for refillable cylinders at this time. This is also the case for other components of the party balloon market, for example, pre-inflated balloons sold to consumers, pre-inflated balloons for major events and conferences set up by professional event organisers who use refillable helium cylinders. However, following the introduction of a safety standard the ACCC will monitor the market to assess whether regulatory intervention results in behavioural change.

The market

There are no published reports on the size of the market for non-refillable helium tanks, however, through our discussions with a major wholesaler, we estimate that the market for non-refillable helium tanks consists of up to 8 wholesalers/importers, 3 of which are major suppliers, 3 of which are medium size suppliers and the others smaller suppliers.

Further (from our conversations with a major supplier) we estimate that there are approximately 20 major retailers which range from large general merchandise stores (Spotlight, Kmart, Target, Big W and others) as well as a number of medium sized specialist stores (Reject Shop, Koch, Shiploads). These retail suppliers have multiple outlets across the country.

There are also a large number of small, independent outlets which includes selected newsagents and other small businesses where non refillable helium tanks can be purchased (from our conversation with a major supplier, the number is estimated to be around 600-800).

The ACCC has also conducted research and analysis regarding the type of wholesale and retail businesses that sell non-refillable helium tanks and what component of their sales would consist of these types of products.

For wholesale stores and party supply stores, the sales of non-refillable cylinders is one segment of their total sales with suppliers selling other types of products to retailers such as tableware, party accessories and baking accessories, amongst other products. Party supply stores offer services including rental of refillable cylinders, in store inflation of balloons and decorative services.

For retail stores such as Target, Kmart and Big W, we estimate that the sales of balloon kits with non-refillable cylinders is one segment of their overall sales as these types of stores sell a wide range of products including clothing, entertainment and home products and sports equipment. The same rationale can be applied to the small businesses and newsagents. The sales of these products would likely represent a slightly larger component for retail stores such as Spotlight that nevertheless sell other products (predominantly craft and home products).

It is estimated that the annual market for non-refillable helium cylinders is approximately 320,000 units p.a. generating sales revenue of around \$30 million for the sector. Estimates of costs and benefits for the various options have been based on these assumptions.

2. Why is government action needed?

The misuse of non-refillable helium cylinders - a common, easily accessible and cheap product as a means to suicide must be addressed. In proposing regulatory intervention the Government's objective is to:

- Reduce the level of suicides from the misuse of the product, by reducing the amount of pure helium in the product and
- Maintain consumer access to the product for legitimate uses and avoiding undue impact to industry.

The Australian consumer product safety framework is underpinned by the ACL. The ACL is set out in Schedule 2 to the *Competition and Consumer Act 2010 (CCA)*.¹ Section 104 of the ACL empowers the Commonwealth Minister to make a mandatory safety standard for a consumer good (amongst other things), imposing certain requirements that are reasonably necessary to prevent or reduce a risk of injury. These requirements may relate to the performance, composition, contents, methods of manufacture or processing, design, construction, finish or packaging of a product. Any requirements under a mandatory safety standard should be reasonable and proportional to the risk or threat to a consumer to prevent or reduce the risk of injury. Suppliers must comply with mandatory safety standards with the definition of a supplier encompassing retailers, wholesalers, distributors, importers or manufacturers. Penalties apply where a supplier fails to meet the requirements of a mandatory safety standard.

Consumer goods under the ACL are goods for an amount not exceeding \$100,000 or goods that cost more than \$100,000 but they are of a kind ordinarily acquired for domestic, household or personal use or consumption. Non-refillable helium cylinders fall within this definition.

¹ Federal Register of Legislation 2005, Australian Government, Canberra, <https://www.legislation.gov.au/Details/C2019C00149>, viewed 28 July 2022.

The ACCC considers that it is appropriate to take action to address non-refillable helium cylinder safety concerns. Government is empowered to act under the ACL where the accumulation of evidence indicates that regulatory intervention is reasonable and necessary to prevent injury. Various Coroners have also recommended on a number of occasions in reports and correspondence to the ACCC following a coronial investigation that it considers various risk controls appropriate for the regulation of non-refillable helium cylinders to reduce the prevalence of suicide through the use of these products.

There are currently no mandatory safety standards under the ACL specifically for helium balloon kits.² To the ACCC's knowledge suicides from non-refillable helium cylinders has not been addressed in overseas jurisdictions. The combination of the availability of high purity helium and the rapidity of the lethal effects of helium inhalation results in significant numbers of Australians dying each year. The ACCC considers that only the government has the capacity to intervene successfully to take action to reduce the number of deaths by intentional misuse of non-refillable helium cylinders.

Wholesalers, suppliers and retailers are aware that helium cylinders have the capacity to cause harm where misused. This is indicated by these entities providing warnings that helium cause is not to be inhaled as in high concentrations it may cause asphyxiation. However, the market has not to date taken further measures, such as the dilution of helium with oxygen proposed in the mandatory safety standard. This appears to be because unilateral action by an individual supplier is unlikely to be in its self-interest as the inclusion of an amount of oxygen with helium can detrimentally affect balloon performance known as a balloon's float time. This is the length of time that a balloon remains afloat once filled with helium. Therefore, it is reasonable to conclude that where a supplier acted unilaterally, its product offering may be regarded by consumers as being inferior to competitors resulting in a loss of market share. Government action would be appropriate here as pure helium non-refillable cylinders present an unacceptable hazard or risk to human health and there is little likelihood the market will correct the problem.

Figure 1 shows data from the National Coronial Information System (**NCIS**) for 2000-2018 relating to suicides by helium and other asphyxiant gases in Australia. Helium related suicides increased between 2000 and 2010 and then plateaued at between 35 and 40 deaths per year (see Figure 1 below).

² There is a mandatory standard prohibiting the use of benzene in balloon blowing kits, Clause 10, Trade Practices (Consumer Product Safety Standards) Regulations 1979.

Figure 1

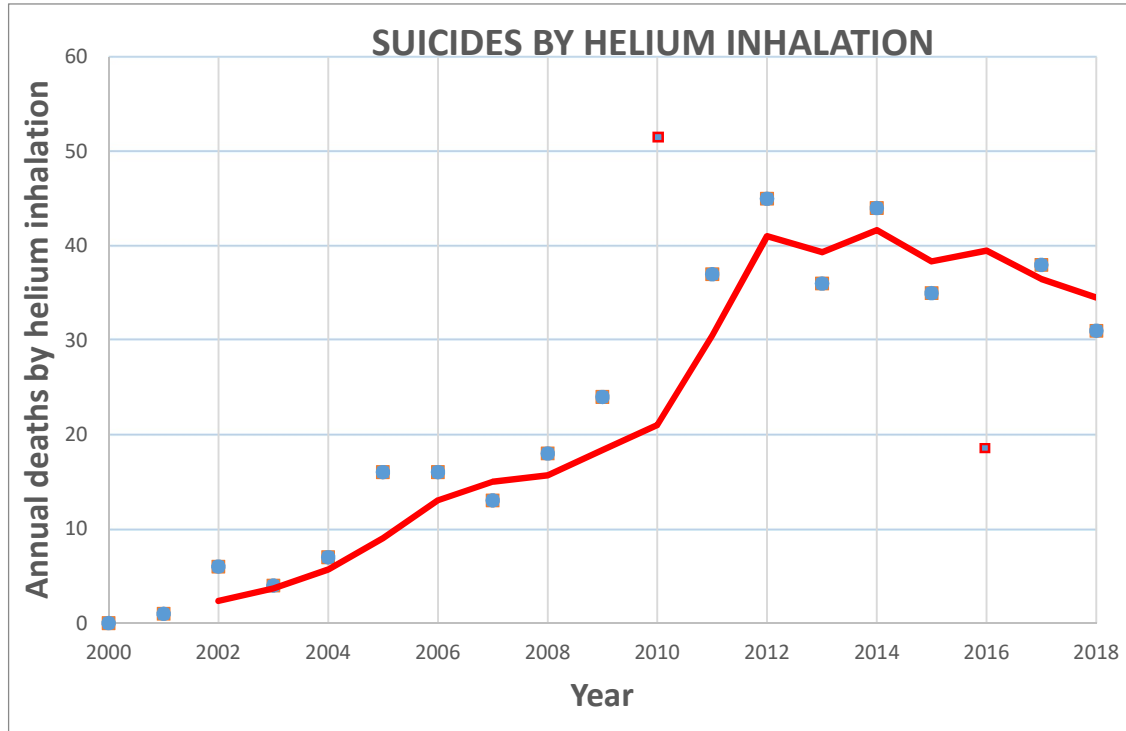


Chart shows the trendline in annual suicides ignoring outlying statistics for 2010 and 2016. These data points have been reinstated after the trendline was added. All graphed incidents are closed cases, so data for latest few years may be incomplete.

Key insights from the NCIS dataset include:

- Between 2000 and 2018 there were 441 helium related suicides – significantly more than nitrogen (211), argon (20) and ‘other gases’ (167) for the same period.
- 289 (66%) of helium-related suicides were by people under the age of 50, including 106 (24%) under 30 years. Only 31 (7%) were by people over the age of 80, the cohort most likely to consider euthanasia.
- In comparison, for nitrogen-related suicides there were 84 (29%) of suicides under the age of 50 years, 23 (11%) under the age of 30 years and 36 (17%) over 80 years.
- Suicide using asphyxiant gases is a national problem with relatively proportionate numbers across all jurisdictions.
- Consistent with broader suicide trends, males are much more likely than females to commit suicide using asphyxiant gases.
- Ordinarily, the source of the asphyxiant gas used in a suicide was either unknown or not checked during a coronial investigation. Where the source of the gas was known, helium (as a balloon kit) was the only gas sourced from retail outlets and party goods suppliers (retailers such as Kmart, Target, BigW, Spartys/Spotlight) in 95 recorded cases. Nitrogen was most sourced from euthanasia organisations (32 cases) and industrial suppliers (29 cases). Terminal illness was recorded as a factor in only a small number of cases: helium (21), nitrogen (19), argon (<6) and ‘other gases’ (<6) cases.

The NCIS data indicates that helium is used in suicides more often than the other asphyxiant gases, is more likely to be used by younger people and is typically sourced from mainstream consumer suppliers. Non-refillable helium cylinders are commercially available and can be obtained reasonably easily.

NCIS data from 2019 and 2020 is unavailable, due to an NCIS policy of only reporting on closed cases. However, Australian Bureau of Statistics data shows an increase in overall suicides between 2018 and 2019.³ It is reasonable to expect that a similar trend will emerge in the use of asphyxiant gases as NCIS cases are closed and added to the dataset. The ACCC has also received 11 coronial correspondences on helium suicides since 2018.

The objective of any regulatory action on non-refillable helium cylinders is to reduce the number of suicides from the misuse of the product, without unduly impacting industry and maintaining people's legitimate enjoyment by being able to use helium to inflate balloons for parties and events. The actions discussed in this paper will be elements of means restriction which will make it more difficult to misuse the product for suicide. This is in line with the Government's broader policy objectives of harm minimisation and suicide prevention in this case through reducing the means of access to lethal self-harm.⁴ Reducing the means of access to lethal self-harm is a well-established practice with other examples including restricting access to certain medications and altering their packaging, installing barriers on bridges and restricting access to firearms and other lethal weapons. This action should be understood within the broader policy context of suicide prevention and mental health policies which also includes prevention and early intervention, treatment and support for the vulnerable.

It is difficult to provide an accurate estimate of the per-year reduction in the total number of suicides. The objective is to reduce the number of suicides from the use of non-refillable cylinders to the point that it becomes an uncommon means of suicide.

A subsidiary objective of the standard is that this means of suicide would no longer be promoted on so called end of life blogs.

Whilst it is quite possible that there would be no deaths attributed to the use of non-refillable cylinders, the ACCC acknowledges that any regulatory action may result in substitution to other gases or other suicide methods if an individual was sufficiently determined to end their own life. For this reason, in the discussion below a number of options and scenarios are proposed.

3. What policy options are you considering?

The ACCC undertook a private consultation from 22 March 2022 to 8 April 2022 via a Briefing Paper on the supply of high-purity helium in non-refillable cylinders and their use in asphyxiation suicides. The ACCC would ordinarily conduct a public consultation on issues that could lead to the development of a mandatory standard. However, given the sensitivities of the subject matter and not wishing to draw further attention to helium cylinders being used as a means to suicide, the ACCC undertook a private consultation with selected stakeholders and invited them to make submissions. The ACCC also conducted meetings with major retailers, suppliers and associations in the first half of 2022.

³ Australian Bureau of Statistics, *Causes of Death, Australia, Statistics on the number of deaths, by sex, selected age groups, and cause of death classified to the International Classification of Diseases (ICD)*, 23 October 2020, <https://www.abs.gov.au/statistics/health/causes-death/causes-death-australia/2019>, viewed 13 July 2022.

⁴ Department of Prime Minister and Cabinet, *National Mental Health and Suicide Prevention Plan announced*, <https://www.pmc.gov.au/news-centre/domestic-policy/national-mental-health-and-suicide-prevention-plan-announced>, viewed 12 September 2022.

The ACCC consulted on the following policy options:

- Take no action (maintain the status quo)
- Mandatory Safety Standard
- Product Ban
- Product Warnings
- Modification of helium cylinder outlet
- Addition of an aversive/bittering agent to helium gas
- Reduction of helium cylinder size available to consumers

Take no action (maintain the status quo)

Maintaining the status quo would mean taking no regulatory action to address the current availability to consumers of high-purity helium in cylinders and their misuse in suicides. There would be no impact on reducing the number of deaths associated with the use of non-refillable helium cylinders as a suicide agent. No additional cost would be imposed on business under this scenario.

Mandatory safety standard

A mandatory safety standard may be made under section 104 of the [ACL](#) that imposes certain requirements that 'are reasonably necessary to prevent or reduce risk of injury to any person'. As noted previously, there are currently no mandatory safety standards under the ACL specifically for helium cylinders.

A safety standard could mandate product design modifications for helium cylinders to reduce the misuse of the cylinders for suicide. The product design modifications considered are a range of 'means restrictions' that make it more difficult to misuse these products for suicide. Means restriction is considered one of the most effective suicide prevention strategies in relation to impulsive suicide attempts, as it allows opportunities for reconsideration and intervention.⁵ The ACCC has also spoken to the Department of Health, who also supported the view regarding means restriction as effective for prevention.

Declines in suicide deaths have been reported in most countries including Australia after restricting access to firearms, toxic domestic gas, pesticides, erecting safety barriers at jumping sites, and the use of new, lower toxicity anti-depressants. The reduction in suicide deaths in most parts of Australia between 1988 and 2007 coincides with restricted access to lethal suicide methods.⁶

The safety standard would apply to the market for non-refillable cylinders. The standard would not apply to businesses that supply already inflated helium balloons to customers online or instore or as part of an events package, for example, a wedding.

Dilution of helium with other gases

⁵ Fleischmann, A, Arensman, E, Berman, A, Carli, V, De Leo, Diego, Hadlaczky, G, Howlader, S, Vijayakumar, L, Wasserman, D, Saxena, S, *Overview evidence on interventions for population suicide with an eye to identifying best-supported strategies for LMICs*, Global Mental Health, v.3 2016, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5314741/>, viewed 30 June 2022.

⁶ Lifespan, Black Dog Institute, *Improving safety and reducing access to the means of suicide*, <https://www.blackdoginstitute.org.au/wp-content/uploads/2020/04/2019-09-16-strategy-9-research-summary.pdf?sfvrsn=8#:~:text=Restricting%20access%20to%20the%20means,prevention%20strategies1%2C2%2C3.&xt=Means%20restriction%20appears%20to%20work,use%20a%20less%20lethal%20means>, viewed 1 August 2022.

The design of a product is fundamental to product safety. Several coroners have recommended that the ACCC consider requiring helium cylinders supplied to consumers be diluted with another gas to reduce the asphyxiant effect of inhaling the gas. The two most obvious candidate gases are oxygen and normal air.

In consideration of the coroners' recommendations and results of earlier consultations with industry on the feasibility of diluting helium with air or oxygen the ACCC has investigated these options and commissioned an Australian National University (ANU) study.

Dilution of helium gas with oxygen gas

The ANU study called '*Buoyancy of Balloons filled with helium-oxygen gas mixture*' concluded that an optimum mixture of 79% helium and 21% oxygen would be considered life sustaining for a significant increase of time over products containing 100% helium. A summary of the report prepared by the ACCC is available at Appendix 1.

The optimum helium (79%) and oxygen (21%) mixture would make the use of the helium cylinders for suicide more difficult to the extent that people would be unlikely to rely on this option. In comparison to breathing pure helium, the time required to reach unconsciousness would increase from around 30 seconds⁷, to around 10 minutes as estimated by a clinical respiratory physiologist from The Westmead Institute for Medical Research.

During this time, the person would experience adverse clinical symptoms including headaches, dizziness, and vomiting due to increasing levels of carbon dioxide from exhaled air. This would mean that the product would no longer be attractive and available as a painless option for suicide.

The clinical respiratory physiologist advised the ACCC that the physical discomfort associated with the use of the blend is related to the longer period to unconsciousness from an estimated 30 seconds for an unblended pure helium product to approximately 10 minutes for a blended oxygen product during which time increasing levels of carbon dioxide from the expired air build up.

However, for someone with sufficient determination the product could still be used as a suicide means. The inhalation of a helium (79%) oxygen (21%) mixture within a confined face/head covering would still cause death over a sustained time where the level of expired carbon dioxide increases and is not able to escape from the head covering.

Harm minimisation is an effective strategy as the significant discomfort arising from the helium oxygen mixture would likely mean that the product is no longer considered as attractive as an option. Where a person was determined to use the product, over time this mix would mean significant discomfort caused from inhalation and provide an opportunity for the individual to reconsider their actions or be interrupted by someone, likely leading to reductions in suicide. In contrast, the inhalation of pure helium is painless, quick and a far "easier" form of suicide.

Evidence of potential effectiveness of diluting helium gas with air in respect of reducing its use as a suicide agent

⁷ Ogden, R, *Assisted suicide by oxygen deprivation with helium at a Swiss right-to-die organisation*, Journal of Medical Ethics, March 2010, p.15.

Both the perception of the lack of effectiveness of a diluted product, and the fact that it may provide a significantly more painful exit, are likely to lead to a reduced use of this product as a means of suicide.

The Safety Data Sheet of a helium gas product supplied by a major US supplier and available in Australia states that its product is a mixture of Helium (85-100%) and air (0-15%).⁸ The US supplier advised the ACCC that it started including air in its mixture in 2014 due to a worldwide shortage of helium at the time. While a mixture of 85% helium and 15% air provides no additional reduction in the efficacy of the gas as an asphyxiant as the effective concentration of oxygen in the mixture would only be 3%, the product's perceived lack of purity has acted as a deterrent. This is evidenced by exit euthanasia blogs which make explicit recommendations to potential users that products containing helium diluted with air, should be avoided as they are considered unsuitable for ending one's life.

Perception of efficacy has been an important factor as a strategy to reduce the incidence of helium balloon kit related suicides. Our view is that helium cylinders containing a blend of helium and oxygen and labelled as such would likely lead to a reduction in the use of these cylinders for suicide.

Effect of He/O₂ gas blend on flotation properties of balloons

The ANU study investigated the effect on flotation time of balloons inflated with a range of gas mixtures (helium and oxygen blends) due to industry concerns about the impact of the mixture on the floatation of balloons.

Flotation time (measured as time to neutral buoyancy) for balloons inflated with standard balloon gas which is pure helium is approximately 12 hours. The study tested latex balloons inflated with helium diluted with 21% oxygen (79:21 mixture of helium oxygen (He:O₂)) and found they had float times of approximately 7 hours. This represents a diminishment in the 'float' time of a balloon. However, these balloons are generally inflated for parties and celebrations close to the time that they are required and the ACCC considers that this float time is an appropriate balance that retains adequate product usefulness.

It is difficult to estimate the effect of the reduced flotation time on the market. However, while a reduction in flotation times may diminish consumer interest we would anticipate that it would manifest as a modest adjustment in the market over time. Industry has advised that alternatives exist for consumers, as they can purchase already pre-inflated balloons or have the balloons blown up in store rather than purchasing non-refillable cylinders and inflating the balloons themselves.

An industry stakeholder also conducted testing with the 21% oxygen mixture on latex balloons and found similar floatability times. However, testing by the stakeholder demonstrated that the 21% oxygen mixture was not suitable for inflation of all foil balloons due to the increased weight versus latex balloons. The ACCC has spoken to stakeholders about the effect of this on industry. Retailers and suppliers of party balloons have advised that there are also other avenues for consumers to take to inflate foil balloons. This includes having the balloons inflated in store (such as Kmart or Spotlight) or through party stores and companies). For example, our research indicates that consumers can have an 18-inch foil balloon inflated in a store for a cost of \$2 for each balloon, which would be comparable to them renting a non-refillable helium cylinder based on cost of a non-refillable cylinder and the number of this category of balloon able to be filled. Alternatively, consumers may purchase or rent refillable helium cylinders either in a store or obtained online.

⁸ Worthington Industries, Safety Data Sheet, Helium Blend, [https://worthingtonindustries.com/getmedia/cca4ad74-ab5f-4731-a0f4-c705e16d5e12/WC032-Helium-US-\(English\).pdf](https://worthingtonindustries.com/getmedia/cca4ad74-ab5f-4731-a0f4-c705e16d5e12/WC032-Helium-US-(English).pdf), viewed 20 July 2022.

Flammability of oxygen-enriched gas in balloons

The ANU study on the effect on flotation time of balloons also measured oxygen enrichment over time inside the balloons to determine if there was an increased flammability (explosion risk) for balloons inflated with a helium-oxygen blend due to the subsequent differential leaching of helium from the balloons.

Balloons inflated with mixtures of He:O₂ did show evidence of oxygen enrichment inside the balloons over time. Flammability was tested by placing a flame near balloons containing a range of levels of oxygen, up to 100%. The ANU study found that there was no evidence of a higher likelihood of explosion or flammability for any of the tested concentrations of oxygen.

Substitution from non-refillable cylinders

As the proposed helium / oxygen blend leads to the reduction in float times, it is reasonable to consider the degree to which consumers would substitute to the other alternatives of direct inflation of foil balloons or hiring of refillable cylinders and whether there may be an additional cost that may be attributed to this shift.

Our review of the market is that non-refillable cylinders are sold with latex balloons rather than foil balloons, although foil balloons may be purchased separately. It is difficult to assess whether substitution to other means would occur, however, consideration of the alternatives suggests that the direct costs to a consumer are comparable. As noted, a representative cost of an 18-inch foil balloon is \$2 per balloon. Latex balloons are available at a cost of \$20 for 20 balloons. Refillable cylinders may be hired for around \$66 (balloons included) for a cylinder with sufficient helium gas to fill 40 latex balloons. This compares to around \$50 (balloons included) to purchase a non-refillable cylinder that will fill 30 latex balloons.

It is arguable that there is a positive utility from the purchase of a non-refillable cylinder against the alternatives, although counter arguments may be proposed. In either case, differences in consumer utility may be marginal and are not easily calculated.

Labelling of helium cylinders

The standard will also include a requirement to add labelling to the cylinder and/or secondary packaging to advise that the cylinder contains an oxygen and helium mixture. It is expected that this will act as a deterrent, as the product will be viewed as not being as effective as a means to suicide. The labelling should be clearly visible, prominent, legible, and permanently affixed to the product. Examples of labelling are below:

Composition/information on ingredients

Chemical Name	%
Helium	79
Oxygen	21

Label elements

Signal word
Hazard statement



Warning
Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

The standard will also require warnings about inhalation of the gas such as 'do not inhale' and 'may cause suffocation'. This will address foreseeable misuse of the product where helium gas is sometimes inhaled by people deliberately for their own entertainment.

Dilution of helium gas with normal air

Normal air is made up of 78.1% nitrogen (also an asphyxiant), 20.9% oxygen, 0.9% argon (also an asphyxiant) and 0.1% other gases (including trace amounts of carbon dioxide, methane, water vapor, neon etc). As normal air contains about 21% oxygen, the amount of air needed to be added to helium to make the gas blend life-sustaining (21% O₂) is substantial.

The table below provides the results of calculations of the amount of oxygen included when normal air is used a diluent for high purity helium. The purity of currently supplied helium (assuming air as trace) is indicated in yellow. The helium/air levels at which the oxygen level becomes life sustaining is shown in green.

% He	% air	Resulting O ₂ %	Life-sustaining?
100	0	0	No
95	5	1.05	No
80	20	4.2	No
50	50	10.5	No
40	60	12.6	No
30	70	14.7	No
10	90	18.9	No
	100	21	Yes

The use of air as a diluent does not appear to be an acceptable modification to helium balloons, because at the level of oxygen required to sustain life, the flotation effect is lost as there is no (or negligible) helium in the gas mixture.

Product ban

Under the ACL, bans can be placed on products and product-related services if there is a risk that they may cause serious injury, illness, or death. The Commonwealth Minister has the power to declare a permanent ban on a product or product-related service. Permanent bans apply nationally. If a ban was placed on non-refillable helium cylinders, it would reduce the number of suicides through the use of these cylinders as this means would be removed from the market. However, it would also eliminate a \$30 million dollar industry, and remove access to the product for consumers and prevent its legitimate use.

Other options considered

Other options considered in the Briefing Paper were product warnings, modification of the helium cylinders to prevent continuous flow of helium gas, adding a bittering agent to the helium gas, or reduction of the helium cylinder size available to consumers. However, these options were found not to be viable.

Warnings

Warnings about the dangers of helium are already used by suppliers and have not been sufficiently effective where the product has been used for intentional misuse. Some retailers have warnings on their websites, and industrial gas suppliers have published pamphlets and short videos on the dangers of inhaling helium on their websites. Warnings on websites not regularly visited or searched by consumers are unlikely to have any significant educative impact on consumers, making them aware of the dangers of inhaling helium. Consumers intending to misuse helium for suicide will not be seeking this information as they would already be aware of the dangers of helium inhalation. Warnings of a danger are unlikely to influence someone who is intending to use the product for the very reason it is dangerous. Warnings are only effective where people are looking for information and want to use product safely. In this case, the non-refillable helium cylinders are deliberately being misused as suicide means.

International voluntary standards on product safety stewardship recognise that warnings are the least effective form of risk control with a preference given to modification of the product to remove the risk or potential harm where feasible. By way of example, the International Organization for Standardization publishes ISO 3864 which provides standards for safety signs and markings including a colour coding system depending on the type of hazard and the type of action sought by the product user. ISO 7010 details examples of graphical hazard symbols on hazard and safety signs. For example, the red circle with a line through it indicating a prohibition of an action. As indicated above, where there is intentional misuse a warning is not likely to be effective.

Product modification

A number of options were considered early to modify the product in order to limit access to helium or make access less attractive. In summary, these options were discounted as they contained the same flaw being that they did fundamentally reduce access to helium but provided a certain barrier to its access.

The helium cylinder outlet could be modified to prevent or minimise the continuous flow of helium gas. However, we were advised that this type of mechanism had yet to be developed. At an intuitive level, modifying the outlet of the cylinder would likely be costly to develop especially relative to the low cost of the product which ranges from \$60 - \$90 depending on cylinder size. There were also questions about who would develop and pay for this option and how as well as the potential time it may have taken to safely implement. As noted, such an option may not fundamentally alter access to helium.

The addition of a bittering agent was an option considered but would only be effective if it was not intended to be used as a suicide means. It is not likely to be a barrier for someone determined to use it for suicide purposes and would therefore have little impact on suicide rates. Again, access to helium is unaltered. A bittering agent to helium gas or a reduction in helium cylinder size would also result in unpleasant effects for legitimate users. Balloons inflated with the adulterated gas may smell unpleasant, especially if the chemical leaches from the balloons. Popping balloons can result in an unpleasant smell at the location, especially if this was indoors.

Reducing the size of the cylinders available for supply in Australia was considered but would also not likely impact in reducing suicide rates. The cylinder will still contain the same high purity of helium that will lead to unconsciousness, although it may take longer to achieve this. Also, an individual may seek assistance from others in ending their lives, to assist or speed up the process. A reduction in the size of the cylinders will also significantly inconvenience legitimate users, who will need to buy numerous cylinders to inflate their balloons.

For all these options the same high purity of helium would still be present in the non-refillable helium cylinders, which would likely not be effective in reducing suicides. The ACCC consulted on these options and discussed them with industry concluding that they would not to be viable for the reasons discussed.

4. What is the likely net benefit of each option?

The ACCC has found that there are 3 viable policy options in dealing with the misuse of non-refillable helium cylinders in suicides. These are:

- Option 1: Take no action (maintain the status quo)
- Option 2: Mandatory safety standard
- Option 3: Product ban

Option 1: Take no action (maintain the status quo)

Benefits

Not taking any action will mean there are no additional costs to manufacturers and supply chains, and sales of helium cylinders will continue unchanged.

There would also be no additional costs incurred by Government in administering and enforcing any regulation.

The use of non-refillable helium cylinders will continue at a level where the rate of deaths will remain unchanged.

The industry will remain at its current levels of activity.

Burden

Not taking any action to address the availability to consumers of high-purity helium in non-refillable cylinders is expected to result in the continuation of misuse of the product in suicides at the current rate of 35-40 people per year. The coronial data suggests that this rate has been largely unchanged since about 2010.

Guidance published by the Australian Government on how to treat the benefits of regulations designed to reduce the risk of physical harm, uses an estimate of \$5.1 million (2022) based on empirical evidence for the value of a statistical life.⁹ This figure suggests that the annual cost of helium misuse ranges from \$178.5 million to \$204 million for an average of 35-40 suicides occurring per year.¹⁰

⁹ Department of Prime Minister and Cabinet, Office of Best Practice Regulation Best Practice Regulation Guidance Note Value of statistical life, August 2021, <https://obpr.pmc.gov.au/sites/default/files/2021-09/value-of-statistical-life-guidance-note-2020-08.pdf>, viewed 13 July 2022.

¹⁰ A statistical life is assumed to be the life of a young adult with 40+ years of life expectancy, while a statistical life year is an estimate of the value society places on a year of life.

Option 2: Safety standard

Dilution of helium with other gases

Benefits

The benefits of requiring the addition of about 21% oxygen to helium cylinders include:

- Significantly decreased potential for use in suicide (although not complete prevention). 21% oxygen is expected to reduce the incidence of successful suicides as attempts to use this gas blend for suicide would result in unpleasant side-effects associated with cumulative levels of carbon dioxide and delayed loss of consciousness, providing opportunities for reconsideration by the user and intervention by others. Expert advice provided by a respiratory physiologist from The Westmead Institute for Medical Research estimates that time to unconsciousness would increase from around 30 seconds¹¹ to 10 minutes, and the person would feel an ever-increasing level of discomfort. This is different from the use of commercial mixtures of helium and oxygen (Heliox) which is already available and used for medical applications with an appropriate mask which eliminates the carbon dioxide that is breathed, so there is no discomfort. Heliox is also used in recreational diving through self-contained underwater breath apparatus (**SCUBA**) in order to permit underwater diving to greater depths for longer periods of time.¹²
- As discussed above, a major US-based manufacturer has developed a balloon gas containing up to 15% air which is also available in Australia.¹³ This product is identified (by brand) by authors in end-of-life blogs as unsuitable for end-of-life purposes due to the dilution of helium.
- The mandatory helium standard is expected to lower the number of suicides from the use of helium cylinders. The table below sets out information provided by the NCIS to the ACCC on the age range and the number of total deaths involving helium.

Table 1 - Intentional self-harm deaths involving helium by age range from 2000-2018 (NCIS)

Age range	<21	21-30	31-40	41-50	51-60	61-70	71-80	>80	Total Deaths
Total	31	75	87	96	51	41	29	31	441

- It is difficult to ascertain how many deaths will be prevented through the use of helium cylinders with the introduction of a new mandatory standard. The objective is to decrease the number of suicides involving helium to approximately 10-15 deaths per year 2 years after the standard is implemented, as was the case prior to 2010 (see Figure 1 of this paper), where the knowledge of helium as an easy and painless suicide means and was not as publicly well known.

¹¹ Ogden, R, *Assisted suicide by oxygen deprivation with helium at a Swiss right-to-die organisation*, Journal of Medical Ethics, March 2010, p.15.

¹² Martin, Lawrence, *Diving with non-air gas mixtures: Nitrox, Heliox, Trimix*, <http://www.lakesidepress.com/pulmonary/books/scuba/section1.htm#:~:text=WHAT%20IS%20HELIUM%3F,there%20is%20no%20saving%20there>, viewed 20 July 2022).

¹³ Worthington Cylinders, Safety Data Sheet, Helium Blend, <https://worthingtonindustries.com/getmedia/382c642e-7458-4903-8ae7-3181c426be32/WC042-Helium-Blend.pdf>, viewed 2 August 2022.

- Assuming the value of a statistical life is around \$5.1m,¹⁴ table 2 shows the potential cost savings for lives saved per year if the mandatory standard were to be introduced. If potentially 10-20 lives could be saved, this would more than offset any costs in implementing the standard such as labelling requirements as discussed below. It is arguable that even 1 life saved per year would make the mandatory standard worthwhile and offset any costs.

Table 2 - Summary of potential benefits

Number of deaths potentially prevented each year	Estimated Statistical Value of lives saved per year (one life valued at 5.1 million)
10 lives	51 million
15 lives	76.5 million
20 lives	103 million

- The ANU study found no significant reduction in the utility of the diluted helium. The ACCC is aware that when helium prices are high (for example during shortages), some suppliers dilute helium with air. A manufacturer has advised that levels can be as low as 80% to 85% helium, but that balloon inflation is not significantly affected. This is consistent with the results of the ANU study.
- Continued consumer enjoyment from the legitimate use of the product as there is minimal impact on buoyancy/flotation times of balloons for consumers inflating their own balloons.
- The ANU study found no significant increased risk of flammability or explosion from the added oxygen gas or oxygen enrichment inside the balloon after leaching of helium from the balloon.
- Commercial mixtures of helium and oxygen ('Heliox') are already available from Australian gas manufacturers/suppliers and have been safely used for many years for scuba diving and medical applications.
- The cost of the proposed gas mixture (on a per volume basis) under a mandatory standard would be cheaper than the current high purity helium. Oxygen is significantly cheaper than helium. Table 3 below shows the prices for D size cylinders, as a comparison.¹⁵ The extent to which suppliers will pass on any costs to consumers is unknown. There may be additional costs in blending the 21% oxygen mixture which is done by overseas suppliers, but estimates indicate that the proposed gas mixture will be cheaper.

Table 3 – Prices of D-size non-refillable helium cylinders

Gas Type	Cylinder Size	Price/Cylinder
	D Size – 1.5m	(\$)

¹⁴ Office of Best Practice Regulation, *Best Practice Regulation Guidance Note Value of Statistical Life*, August 2021, <https://obpr.pmc.gov.au/resources/guidance-assessing-impacts/value-statistical-life> viewed 4 July 2022.

¹⁵ Information sourced from BOC Australia <https://www.boc.com.au/shop/en/au/gases/helium-gas>, viewed 13 September 2022).

Helium Balloon Gas (95% purity)	D	\$170
Oxygen (Industrial grade 99.5% purity)	D	\$72.81

Burden

The limitations and impacts of requiring the addition of about 21% oxygen to helium cylinders include:

- A diminishment in the 'float' time of a foil balloon from approximately 12 hours to 7 hours. The ACCC considers that as consumer and supplier awareness is raised, balloon inflation or delivery times could be adjusted so there is still sufficient time for balloons to remain afloat for consumers to use for functions and parties.
- Balloon gas sourced from non-refillable cylinders available under the mandatory standard would not be suitable for foil balloons, balloon decorations that are prepared well in advance of events or for balloons that are required to float for an extended period e.g., a conference held over several days. However, commercially supplied balloon decorations are usually prepared by balloon artists or party-supply businesses. Balloon decorations may be floating (with helium) or fixed (with air). Decorations using helium are likely to be created from large refillable helium gas cylinders purchased or hired from industrial gas suppliers under business-to-business arrangements. Balloon artists and party suppliers have advised the ACCC that they are very unlikely to use the small non-refillable helium cylinders available to consumers and sold by retailers.
- There may be an equipment cost for some overseas gas supply companies to switch from the more concentrated helium gas to a helium/oxygen mixture for retail consumption. However, this is expected to be a one-off establishment cost of purchasing gas mixing equipment. It is likely that many gas producers already have this type of equipment if they supply gas mixtures or produce made-to-order gas mixtures. Many domestic suppliers also purchase prefilled cylinders from larger overseas gas suppliers and would therefore not be required to install mixing equipment.
- Stakeholders advised that most labelling in relation to the dangers of helium inhalation are already contained on the cylinders. However, labelling that the product is a helium mixture is likely to result in a small cost by requiring minor changes to the product labels. This is likely to include a one-off cost for label redesign and printing that is estimated to be in the range of \$300-\$500 per product line. This is based on advice received from the Australian Toy Association that for comparable changes to labelling on toys the one-off cost would be approximately \$500 per product line. As there are around 8 helium cylinder suppliers, who supply 2 different sizes of the cylinders, the cost to industry of these labelling changes is estimated to be around \$1,000 for each supplier (and \$8,000 for all suppliers).
- General compliance - related compliance and administrative tasks apply to all entities in the supply chain. This includes labour costs associated with complying with the mandatory standard (e.g., accessing and reading standards, ensuring appropriate testing that the product conforms with the standard). There are around 8 wholesale/importers of non-refillable helium cylinders in Australia. It is estimated that a compliance officer would spend one hour per week (or 50 hours per year) at a

wage of \$45.50 (the OBPR prescribed work-related labour rate)¹⁶ on compliance-related administrative tasks. Once a 75% loading is applied to account for on-costs and overheads this becomes \$79.63 an hour. If each supplier had one compliance officer, this would equate to a labour cost of \$3,982 per supplier per year (and \$31,852 for all suppliers).

Table 4 - Summary of potential costs

Source of costs	Details	Total costs (8 domestic suppliers)
Compliance/administrative costs	Costs associated with complying with the new standard	\$79.63 X 50 x 8 = \$31,852
Labelling costs	One off cost associated with label redesign and printing for 2 product lines	\$500 X 2 X 8 = \$8,000
Blending costs	Despite requests for information during the consultation period, suppliers did not provide any predictive costings. This is because most blending for non-refillable cylinders occurs from overseas suppliers	Unknown

Note - It is expected that any compliance costs in relation to mixing the blend, labelling and ensuring compliance with the standard will be offset over a reasonable timeframe given the lower cost of oxygen, compared to a 100% helium blend.

- Market and import data suggest that most of the helium cylinders supplied to Australian consumers are imported. Manufacturers and importers of the cylinders may be adversely affected by the proposed mandatory standard. Manufacturers of helium cylinders may choose to stop supplying these cylinders into Australia rather than supply cylinders that are compliant with the Australian mandatory standard. This may be because they do not wish to supply a different (compliant) product to the small Australian market, or they do not wish to supply the safer diluted helium globally. This will be a business decision for the overseas manufacturers.
- Businesses that import non-refillable helium cylinders will be adversely affected if overseas manufacturers decide to not supply cylinders that comply with a mandatory standard requiring the dilution of helium with oxygen.
- If overseas manufacturers and importers stop supplying non-refillable helium cylinders, Australian consumers' access to this product may be significantly reduced. However, the domestic industrial gas industry may have the ability to address the shortfall of the helium cylinders for domestic use.

¹⁶ Office of Best Practice Regulation, *Regulatory Burden Measure Tool*, Appendix 2: Default work-related and non-work-related labour rates, <https://obpr.pmc.gov.au/resources/guidance-assessing-impacts/regulatory-burden-measure-tool>, viewed 13 September 2022.

Option 3: Product ban

Benefits

A product ban on 100% non-refillable helium cylinders would mean that the product is no longer available to consumers in that form and would not be able to be used to enable suicide. This is likely to have a positive impact on the rate of deaths associated with self-harm consistent with the reduction in deaths from the introduction of a mandatory safety standard. This is because lack of access to the product and a product modified with oxygen are the same in that the product is no longer a useful mechanism for suicide. Banning the product would produce a benefit of between \$51 million to \$103 million (for prevention of an average of 10-20 suicides occurring per year). When considering the \$30 million dollar cost to industry (discussed below), this would result in a net benefit of around \$46.5 million per year (for 15 lives saved).

Burden

Banning helium cylinders would reduce access to a product that is safe when used for its intended purpose and would significantly affect industry in reduced sales. Consumer utility would also be impacted. A ban would eliminate a \$30 million dollar industry. It will remove access to the product and prevent its legitimate use. If the product is used for its intended purposes, it does not present a safety risk.

5. Who did you consult and how did you incorporate their feedback?

In March 2022, the ACCC commenced a confidential and targeted consultation (due to the sensitivity of the matter) with stakeholders via a briefing paper. We invited stakeholders such as industry groups, government, and retailers to make a submission relating to potential policy options in the regulation of non-refillable helium cylinders. The ACCC also conducted meetings with major retailers, suppliers and associations and the Department of Health during the first half of 2022.

The ACCC received 17 submissions from a range of stakeholders. Due to the sensitivities of the subject matter, the ACCC does not intend to make the submissions public. A list of the stakeholders who made submissions can be found in Appendix 2.

11 stakeholders were in favour of the following:

- Introducing a mix (helium 79% and oxygen 21%) for non-refillable helium cylinders
- Requirement of warning labels to be included.

2 stakeholders were unsupportive, while the remaining 4 were neutral. The stakeholders that were not supportive of a mandatory standard stated that this area was best left alone, and that the US manufactured product which contains 15% air is curtailing helium related suicides. However, evidence indicates from continued coronial correspondences to the ACCC, mandatory injury reports and NCIS data that helium related suicides are continuing and as discussed previously the 15% air in the US manufactured product is not considered life sustaining. We note that these stakeholders supported a proposed safety standard if there was a lower blend of helium of approximately 10% oxygen. This is because the lower rate of oxygen would have less adverse impacts on balloon float time and would permit the continued use of foil balloons.

Industry suppliers and retailers also commented that a standard requiring an exact and precise 21% oxygen blend would not leave any room for any slight error in the make-up of the mixture, and would potentially be a breach of the standard if a precise 21% of the oxygen was not contained in the cylinder. Following this feedback, the ACCC proposes that a mandatory standard would require the oxygen composition of the gas within the non-refillable helium cylinder to be 21% +/- 1.0% of total gas composition by volume.

A supplier also advised that the 21% oxygen mixture was not suitable for inflation of foil balloons due to the increased weight. The ACCC also consulted with these retailers, suppliers, and associations on the effect of this and that there are other viable options available to consumers to inflate foil balloons such as having them inflated instore or at party shops, or by using refillable cylinders (available in store or can be purchased online). For example, consumers can have an 18-inch foil balloon inflated in store for a cost of \$2 for each balloon, which would be comparable to renting a non-refillable helium cylinder.

As mentioned above, the ACCC has consulted with various experts throughout this process. The ACCC first consulted with ANU to determine the optimal mixture that would be considered life sustaining whilst providing continued consumer enjoyment from the legitimate use of the product.

The ACCC then consulted with a clinical respiratory physiologist from the Westmead Institute for Medical Research to determine the time it could take for a person to reach unconsciousness with the mixture of helium (79%) and oxygen (21%).

The ACCC has also made a submission to the World Trade Organisation consistent with Australia's technical barriers to trade obligations. There was no opposition to the proposed instrument.

6. What is the best option from those you have considered?

The ACCC considers that the best option is Option 2 – a mandatory safety standard under section 104 of the ACL for non-refillable helium cylinders to reduce the use of the products in suicides – as it provides the greatest net benefit as outlined in tables 5-7 below. The mandatory standard should require the addition of about 21% oxygen to the helium gas used in non-refillable helium cylinders. Labelling requirements on the product should also be introduced, noting that the product is not pure helium, should not be inhaled and may cause suffocation.

In tables 5-7 below, we have used a figure between 10 and 20 for the number of lives saved for all 3 options. Even though data obtained from NCIS indicates that the number of suicides range between 35 and 40, the ACCC considers that a figure between 10 and 20 is more realistic for option 2 and especially for option 3. If a mandatory standard or a product ban were to be implemented, in practical terms, fewer people (compared to the current 35-40 people) would use this method as a means to commit suicide. This is because this method would not achieve the intended effect (or it would be more difficult to achieve the intended effect), therefore, people intending to use this method to commit suicide would substitute this method for another. Accordingly, we have used the figures of 10, 15 and 20 lives in tables 5-7 below to demonstrate the net benefits (or loss) of each of the three considered options on a per annum basis.

Option 1 has the highest net cost to society of between - \$50.96 million and - \$102.96 million due to lives not saved. *Option 3* delivers a net benefit of \$21 million, \$46.5 million and \$73 million due to lives saved. There is a substantial cost to industry of \$30 million per annum for

each scenario as a product ban means that non-refillable cannisters would not be permitted to be supplied. *Option 2* delivers the highest net benefit of \$50.96 million for 10 lives saved, \$76.46 million for 15 lives saved and \$102.96 million for 20 lives saved on a per annum basis. Based on these calculations option 2 has the highest net benefit and is therefore the preferred option.

Table 5 - Option 1: Take no action (maintain status quo)

Number of lives saved	10	15	20
Benefits to industry (m)	0.04	0.04	0.04
Costs (m)	51	76.5	103
Net loss (m)	(50.96)	(76.46)	(102.96)

Table 6 - Option 2: Mandatory safety standard

Number of lives saved	10	15	20
Benefits (m)	51	76.5	103
Costs to industry (m) – compliance and labelling (\$39,852 +\$8,000 = approx. \$40,000)	0.04	0.04	0.04
Net benefits (m)	50.96	76.46	102.96

Table 7 - Option 3: Product Ban

Number of lives saved	10	15	20
Benefits (m)	51	76.5	103
Costs to industry (m)	30	30	30
Net benefits (m)	21	46.5	73

The ACCC considers the mandatory standard would provide the highest net benefit to the community given the potential reduction in suicides versus the costs in implementing this option. As helium is an asphyxiant the ACCC has identified through ANU studies, and

discussions with a clinical respiratory physiologist from The Westmead Institute for Medical Research that dilution of helium with pure oxygen reduces its effectiveness and is likely to reduce the promotion and demand for the misuse of the product as a suicide means as well as prevent death through misadventure. The Westmead Institute for Medical Research who advised that a person attempting to use the proposed blended product for suicide, would experience physical discomfort and importantly an increase in time to reach unconsciousness, allowing more time for reconsideration and intervention by others.

This option is also likely to have limited impact on the market for non-refillable helium cylinders and the legitimate use of the product as a means to inflate balloons for decorative purposes by consumers.

The combination of the availability of high purity helium and the rapidity of the lethal effects of helium inhalation results in significant numbers of Australians dying each year. The addition of 21% oxygen will significantly decrease the potential of the use of the product in suicides, as the inclusion of oxygen means that the product can no longer be used to achieve a quick and painless death as unconsciousness would not be readily achieved.

As discussed elsewhere in this paper, due to the possibility of substitution to other means the ACCC has assessed three options of potential lives saved (i.e., 10, 15 and 20 lives). Notably, even the lowest scenario of 10 saved lives provides significant net social benefit. Importantly, this option allows the continued and legitimate use of the product to inflate balloons for parties, functions and events. There is some diminishment of consumer utility due to reductions in float times for latex balloons and it is likely that foil balloons, especially balloons of 18 inches in diameter or less will not be able to be filled with this blend. However, there are viable, ready and cost-effective alternatives where consumer utility is gained through foil rather than latex balloons.

The direct costs on industry are assessed at \$0.04 million per annum due to labelling and administrative requirements associated with meeting the requirements of the standard. The proposed blend does not appear to impose a cost on suppliers as industry feedback indicates that this blend is likely to be less expensive than pure helium given the cost differential between helium and oxygen.

7. How will you implement and evaluate your chosen option?

Following approval from the Minister, the ACCC will lodge the instrument to introduce a mandatory standard for non-refillable helium balloons on the Federal Register of Legislation. The instrument will commence 3 months after lodgement.

It is critical that this standard be implemented urgently to avoid the risk of stockpiling and noting that publicity around the promulgation of the standard may lead to further awareness being raised amongst those vulnerable to misuse.

The 3-month period is expected to allow industry to implement any changes to products and packaging and undertake any testing necessary to ensure compliance with a new mandatory safety standard. The 3-month period will also provide time for industry to dispose of non-complying stock or source new stock that is compliant.

The ACCC will undertake activities to inform suppliers and stakeholders of the new mandatory safety standard. The ACCC will monitor compliance through its routine surveillance program and continue to assess the relevance of product safety regulation as part of its ongoing review program. The ACCC will also monitor data on the use of helium and substitution to other gases. The ACCC is aware that any proposed regulations may also

make refillable cylinders relatively more attractive for misuse and intends to monitor the use of these products following any regulatory intervention.

The ACCC can only assess the impact of the standard on suicide rates and on the structure of the industry after the changes have been in operation. However, we anticipate that a successful implementation would be a reduction in the number of suicides using non refillable cylinders with industry not unduly impacted.

The ACCC will review the effectiveness of the instrument around 2 years after its implementation. The ACCC will review if there has been a reduction in suicides from helium asphyxiation by undertaking the following:

- Liaise with NCIS to obtain updated data on suicide rates (and assess the data)
- Continue to liaise with coroners to assess whether there has been a reduction in the number of suicides
- Review suicide blogs to gauge if non-refillable helium cylinders continue to be promoted as a means to suicide
- Undertake research to assess the degree to which there has been substitution to other types of gases
- Engage with suppliers and industry to assess if any adjustments are required for the standard.

ACCC contact details

To discuss the proposed mandatory safety standard please email the ACCC at Helium@acc.gov.au.

APPENDIX 1

ANU report summary - Buoyancy of balloons filled with helium-oxygen gas mixtures

The report looks at the addition of oxygen to prevent the use of balloon gas as an asphyxiant, while still maintaining buoyancy in balloons.

Buoyancy

To test the buoyancy of balloon gas and oxygen mixed at different levels, a gas mixing rig was used to fill a balloon with a precise mixture of oxygen and balloon gas. Manual and automated data collection methods were used to monitor balloon buoyancy.

In testing, a mix containing 10% oxygen resulted in a mean lift duration for a balloon of 9.9 hours, while a mix of 24% oxygen resulted in a mean lift duration of 6.2 hours. Each increase of oxygen concentration of 3.9% reduces the mean lift duration by an hour.

Flammability

To test whether increased oxygen concentration in the balloons presents a risk of explosion, a flame was placed near the balloon and the results observed. Tests were conducted on balloons with a range of oxygen concentrations up to 100% oxygen, with balloons at different inflation pressures.

It was demonstrated that balloons inflated with any concentration of oxygen at a range of typical pressures do not have differing explosive risk when ignited.

Conclusion

Test results indicate that oxygen may be added to balloon gas to reduce the capacity for asphyxiation with only minimal impact on the float time of an inflated balloon, thus not impacting on their functionality. A mixture of 21% oxygen and balloon gas will allow party balloons to maintain buoyancy for 7 hours with no dangerous effects from the extra oxygen. As 21% is the same concentration of oxygen in air, this mixture should be breathable (this was not tested).

Therefore, the addition of oxygen into party balloons is mild in its impact on their suitability for general applications.

APPENDIX 2

Stakeholders who made submissions to the ACCC's Helium Cylinder Consultation Paper

- Alpen Products Pty Ltd
- Amscan Asia Pacific
- Australian New Zealand Industrial Gas Association - ANZIGA (Industry members - Air Liquide, BOC Limited, CoreGas Pty Ltd)
- Australian Retailers Association
- Balloon Boutique and Balloon Artists & Suppliers Association of Australasia
- Department of Health
- eBay Australia
- National Retail Association
- NSW Consumer Protection
- Party People
- Queensland Family and Child Commission
- Queensland Office of Fair Trading
- Reject Shop Limited
- Tasmanian Department of Justice (Consumer, Building and Occupational Services)
- Victorian Department of Justice and Community Safety
- Watchdog Compliance Pty Ltd (Represent - Spotlight Retail Group & Alpen Products Pty Ltd)
- Worthington Industries (Balloon Time)