

Consultancy services to inform the development of a Post Implementation Review of the tobacco plain packaging measure

Regulatory Burden Measurement & Analysis of Costs and Benefits

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Introduction

The Department of Health engaged Siggins Miller Consultants Pty Ltd (Siggins Miller) to undertake stakeholder consultation and to conduct an analysis of the costs and benefits of the plain packaging (TPP) measure, to inform the preparation of their Post Implementation Review (PIR) for the Office of Best Practice Regulation (OBPR).

The targeted stakeholder consultation including face-to-face and telephone based interviews, and written submissions (online, email, hardcopy) was undertaken over a period of six weeks from the 16th February to the 27th March 2015, and was advertised in newspapers, via standardised information in organisation communications (e.g. newsletters, e-newsletters, communiqués) and via Twitter. Key informant interviews were conducted with, and written submissions received from the tobacco industry (tobacco companies, wholesalers and importers, packaging manufacturers), retailers, public health organisations and experts, Non-Government Organisations (NGOs), government departments and consumers. A costing survey of tobacco industry representatives and government agencies was also undertaken during the same time period.

This report provides the regulatory burden measurement (RBM) and an analysis of the costs and benefits of the recently implemented tobacco plain packaging measure compared with a 'business as usual' scenario.

The Object of the Tobacco Plain Packaging Act

The tobacco plain packaging measure was implemented through the Tobacco Plain Packaging Act 2011 ("TPP Act") and the Tobacco Plain Packaging Regulations 2011 as amended ("TPP Regulations") (collectively, the "tobacco plain packaging measure"). The objects of the TPP Act are set out in Section 3 of the Act. Section 3 states:

"3 Objects of this Act

- (1) The objects of this Act are:
 - (a) to improve public health by:
 - (i) discouraging people from taking up smoking, or using tobacco products; and
 - (ii) encouraging people to give up smoking, and to stop using tobacco products; and
 - (iii) discouraging people who have given up smoking, or who have stopped using tobacco products, from relapsing; and
 - (iv) reducing people's exposure to smoke from tobacco products; and
 - (b) to give effect to certain obligations that Australia has as a party to the Convention on Tobacco Control.
- (2) It is the intention of the Parliament to contribute to achieving the objects in subsection (1) by regulating the retail packaging and appearance of tobacco products in order to:
 - (a) reduce the appeal of tobacco products to consumers; and
 - (b) increase the effectiveness of health warnings on the retail packaging of tobacco products; and
 - (c) reduce the ability of the retail packaging of tobacco products to mislead consumers about the harmful effects of smoking or using tobacco products."

Methods

Regulatory Burden Measurement

A Regulatory Burden Measurement was conducted to attempt to quantify the regulatory costs of the TPP measure. The methodology used is in accordance with the OBPR RBM framework¹. Accordingly, identified compliance costs (administrative costs and substantive compliance costs) to stakeholders across businesses, community organisations and individuals have been considered. (Note that while delay costs are ordinarily considered under the framework, in this case no delay costs were identified).

The costs of complying with the TPP measure were identified by:

- Consultation process including structured questions regarding costs;
- An online costing survey;
- Written submissions; and
- Published analyses.

These costs include activities associated with conforming to all other relevant government regulation regarding tobacco products. Costs excluded from the Regulatory Burden Measurement, but considered within the Cost-Benefit Analysis, include the indirect costs associated with the regulation.

Analysis of Costs and Benefits

The analysis of costs and benefits was, to the fullest extent possible, done in line with the requirements of OBPR's guidance and advice on cost-benefit analyses, in particular the OBPR Guidance Note on Cost-Benefit Analysis.

In line with OBPR's guidance, the analysis of costs and benefits assesses the benefits and costs on the basis of additional benefits and costs attributable to the introduction of tobacco plain packaging over and above business as usual. Business as usual in this analysis includes compliance with pre-existing tobacco control measures.

In general, a conservative approach was adopted in measuring and valuing both costs and benefits. Where necessary, plausible estimates were derived based on reasonable assumptions with respect to the quality and availability of evidence.

In accordance with the OBPR Guidance Note on Cost-Benefit Analysis, a societal perspective has been adopted in this analysis along with a ten-year analytical time horizon. The estimated costs and benefits over the period are discounted to present day values using a discount rate of 7%.

This report provides an analysis of the costs and benefits of the tobacco plain packaging measure. The main steps in this analysis were to:

- Evaluate evidence regarding the impact of the tobacco plain packaging measure;
- Identify and categorise the benefits and costs of tobacco plain packaging; and
- Measure and monetise the benefits and costs of tobacco plain packaging where possible.

¹ Australian Government Office of Best Practice Regulation. *Guidance Note: Regulatory Burden Measurement Framework* (July 2014) (pg.1). Australian Government Office of Best Practice Regulation. *Guidance Note: Post-Implementation Reviews* (July 2014). (pg. 8)

Identification of Costs and Benefits

Claimed costs and the benefits of the tobacco plain packaging measure were identified from:

- Stakeholder engagement; and
- Published Cost-Benefit Analyses for tobacco plain packaging conducted by foreign government agencies (United Kingdom Department of Health, 2015).

The identified potential social, economic and environmental costs of the tobacco plain packaging measure are:

- Costs to transition to new packaging requirements;
- Potential increased retail transaction costs;
- Increased government monitoring and enforcement costs;
- Reduced profits in tobacco industries;
- Reduced value of tobacco brands; and
- Reduced consumer surplus from tobacco products.

Finally, it is important to note that litigation costs associated with local or international challenges to the TPP measure have not been included in this analysis. This is in keeping with standard practice for analysis of costs and benefits in the context of PIRs.

The identified potential social, economic and environmental benefits of the tobacco plain packaging measure include:

- Health benefits associated with reduced up-take and use of tobacco products, increased cessation of tobacco use and reduced exposure of other people to smoke from tobacco products;
- Productivity gains associated with reduced tobacco use;
- Reduced litter resulting from reduced use of tobacco products; and
- An on-going reduction in the cost of producing the packaging of tobacco products.

These potential costs and benefits are discussed below and quantified where possible. Illustrative examples are also provided where quantification is unable to be undertaken.

Data Sources²

The costs of complying with the tobacco plain packaging regulation were identified by:

- Consultation process including structured questions regarding costs;
- An online costing survey;
- Written submissions; and
- Published analyses.

Multiple attempts were made to engage with all stakeholders and elicit their advice about the cost implications related to the introduction of the TPP measure. Attempts were made via email, telephone and an extensive advertising campaign which included advertisements in newspapers. Multiple methods were made available for stakeholders to submit cost implications related to the tobacco plain packaging measure including via face-to-face

² Data available as at July 2015 were included in this analysis.

interviews, phone interviews, facilitating written submissions, and an online structured cost survey.

Cost data were provided by individual businesses and industry organisations on behalf of their members. Submissions were received from the following members of the tobacco industry: packaging suppliers, manufacturers, importers, wholesalers and retailers. Costing data received in consultations were considered with respect to the business as usual comparator which includes meeting obligations regarding other tobacco control measures (such as tobacco health warnings). Where international data were used for cost estimates, costs were converted to Australian dollars using the average exchange rate for the respective year and inflated, where necessary, to 2012 values.

Data regarding the effects of the TPP measure were sourced from: the consultation process, a review of the published peer-reviewed literature and national data sources including the Australian Bureau of Statistics (ABS) and the Australian Institute of Health and Welfare (AIHW). Finally, relevant data were extracted from the literature and published reports with preference given to peer-reviewed studies that used Australian data.

Results

Cost Data Collection

Multiple attempts were made to engage with all stakeholders and elicit their advice about the cost implications related to the introduction of the TPP measure. Attempts were made via email, telephone and advertisements in 10 daily newspapers. Multiple methods were made available for stakeholders to submit cost implications related to the TPP measure including offers of face-to-face interviews, phone interviews, facilitating written submissions, and an online structured cost survey. Despite these efforts, a number of stakeholders elected not to submit cost data or elected not to participate in the consultation process at all despite offers of various times and locations for interviews and extensions to the timeframe for submitting completed costing surveys.

Costing surveys were started by 13 (State and Commonwealth) Government agencies; however, only three completed the survey in full. An additional 5 (State and Commonwealth) Government agencies raised costs within the stakeholder consultation process but either did not provide cost estimates (data) or stated that costs were non-significant.

In total, costing surveys were completed by 49 members of the tobacco industry. Additional costing data were provided by two industry members during the stakeholder consultation process. Only one of the three major tobacco manufacturers provided specific cost estimates associated with meeting the regulatory changes introduced in December 2012 for the purpose of this PIR. In addition, one business, which is solely an importer, provided limited specific cost estimates. The online cost survey was completed by 48 retailers with additional cost data submitted by two retail representative bodies. Whilst not providing specific cost estimates, one tobacco importer/wholesaler/distributor submitted that from their perspective, there were no incremental costs associated with the TPP measure over and above those incurred in complying with health warnings requirements for tobacco products. Although it is difficult to assess how representative this business is of other tobacco importers/wholesalers/distributors, it does provide some anecdotal evidence that, costs incurred during the implementation period of the TPP measure were, to a large extent, costs that would have otherwise been incurred in the operation of a normally efficient business as considered with respect to the RBM and analysis of the costs and benefits.

In the cost estimate provided by the one major manufacturer, there was evidence that the estimates provided were not specifically attributed to the TPP measure. For example, the costs of print cylinders, which would have been replaced owing to changes in graphic health warnings, or as part of business as usual, were included. Moreover, the cost estimates provided were aggregated under ambiguous headings. No cost activities were described in detail and the units of cost were not provided (e.g. number of labour hours). The submission was also not verified or audited and was marked as commercial in confidence and so cannot be substantively discussed in a public document such as this RBM. It should also be noted that all of the costs identified were one-off, transitional costs and that no ongoing costs to business were identified.

Regulatory Burden Measurement Results

A summary of the costs (for the purpose of the RBM) identified during the consultation process and within published reports are presented in Table 1.

Table 1: Identified cost categories for compliance with the TPP measure

Business	Individuals	Community organisations
1. Plant and machinery	None identified	None identified
2. Compliance activities		
3. Repackaging		
4. Education activities		

The calculation of the RBM was limited by the lack of robust, verifiable data, particularly from industry. As noted above, only one manufacturer provided any indication of potential costs incurred. This submission was taken at face value with only minor adjustment to accord with OBPR guidance on the calculation of RBM.

It is arguable that the incremental cost of an additional regulatory change like plain packaging in the context of multiple regulatory changes and business as usual changes to manufacturing is likely to be non-substantive. For example, in the impact assessment of standardised tobacco packaging conducted in the United Kingdom, the authors noted that the incremental cost of standardising packaging over and above the cost of meeting the European Tobacco Product Directive (which included enlarged graphic health warnings) could be close to zero (United Kingdom Department of Health, 2015). This perspective is reinforced by the cost submission lodged in this PIR process by a tobacco importer/wholesaler/distributor who suggested there were no incremental costs associated with the TPP measure over and above complying with health warning requirements.

Further, estimates of the cost of previous regulatory changes in tobacco control measures such as the implementation of graphic health warnings was substantially less than the costs submitted by the sole manufacturer for implementing plain packaging. It is not clear why the costs associated with plain packaging would differ substantially from these similar changes in the past (indeed as noted above, there is some evidence that any costs associated with implementing plain packaging alone should be similar to that associated with implementing enlarged graphic health warnings at the same time). Without evidence of costs incurred for the remainder of the industry, it is reasonable to discount the sole cost submission received prior to extrapolating it to other manufacturers to account for any distinctions between manufacturers.

Finally, as plain packaging was implemented at the same time as enlarged graphic health warnings, it also must be recognised that it is extremely difficult to disentangle the true cost associated solely with plain packaging from those incurred to implement the new graphic health warning requirements. Each measure involves changes to tobacco packaging and activities ostensibly attributed to plain packaging would also be required to implement the enlarged graphic health warnings. The final RBM figure must be read in light of this inability to disaggregate these activities and the costs associated with them.

In light of the above and in the absence of sufficient information to accurately estimate manufacturing costs, the sole cost submission was taken for the purposes of this RBM at face value (with minor adjustments) and a proportion was applied to those costs in order to obtain a figure for other manufacturers. The methodology employed is conservative as it provides

possible costs for all major manufacturers notwithstanding the potential that the actual incremental cost may be zero.

Legal costs and costs of lobbying activities associated with challenging the tobacco plain packaging regulations were also not submitted or included in the RBM. These costs were incurred voluntarily and are routinely excluded from regulatory burden and Cost-Benefit Analyses.

The following section discusses the estimates included in this analysis under each of the identified compliance cost categories in Table 1.

Plant and Machinery Costs

The sole cost submission received contained estimates of costs with respect to loss on sale of machinery, (excluded from the RBM calculation as per OBPR guidance), print cylinders and engraving as well as costs incurred owing to the need for reconfiguration of, or changes in, operational processes within factories. As noted above, for the firms that did not provide cost estimates, this submission was extrapolated to account for any costs incurred across the industry. The reliance on these cost estimates creates significant uncertainty. However, taking a conservative approach, a non-zero cost was the preferred approach relative to assuming a zero cost. As outlined above, there exists substantive uncertainty in derivation of the cost of plant and machinery attributable to the TPP measure. It is considered that the above approach is conservative and is likely to overestimate the ‘true’ attributable cost to the TPP Act. This is due to the fact that the incremental cost of meeting the requirements of tobacco plain packaging (where changes were contemporaneously required in order to meet changes in tobacco health warnings) may be zero.

Total plant and machinery costs are estimated as the sum across industry members and included as a start-up cost under the heading of ‘manufacturing and importers-purchasing’ in the regulatory burden measurement. The total cost is estimated as \$11.42 million.³ The underlying calculation has not been included due to the commercial in confidence data provided and at the request of the tobacco company which made a submission.

Packaging Compliance

Packaging compliance relates to other potential transitional costs not arising from plant and machinery changes. Similar to the plant and machinery costs, only one of the three major manufacturers operating in Australia provided an estimate of packaging compliance costs during the consultation process. The estimate was not detailed with respect to the activities that were undertaken in relation to the TPP measure (and would not have otherwise been incurred). Once again, as noted above, the estimates provided were taken at face value for the sole manufacturer and then multiplied by a proportion to account for potential costs for the rest of the manufacturers, if indeed any were incurred. Whilst this increases the uncertainty of the cost estimates it ensures a conservative cost estimate irrespective of the lack of evidence provided during the consultation process.

During the consultation process, no ongoing costs were provided. It is expected that ongoing quality assurance procedures would be part of normal efficient business practice. Thus, no substantive ongoing compliance costs are included in the analysis. This is consistent with a report assessing the impacts of revising the Tobacco Products Directive in the European Union (Tiessen et al., 2010).

³ This figure is subject to the limitations described on pages 7 to 9 above.

The total costs of packaging compliance are estimated as \$57.73 million.⁴ The calculation of this estimate has not been included here due to the commercial in confidence nature of the estimate provided.

Repackaging of Cigar Products

The TPP measure in itself does not require a cigar to have a cigar band. However, a single cigar band that is compliant with the TPP measure may appear on a cigar and non-compliant cigar bands must be either removed or covered with a single compliant adhesive band.

Whilst a total cost estimate was provided by one cigar importer, this estimate included the costs associated with retrieving products that did not meet packaging regulations from the market place, and repackaging or destroying retrieved products. Some of the costs associated with ensuring tobacco products and packaging were compliant with plain packaging laws may be associated with the TPP measure; however, these costs are considered to have been accounted for in the industry-wide estimates of packaging and compliance costs provided above.

Education (Manufacturers)

Education activities are likely to be undertaken by industry members to be fully aware of new regulations and to undertake activities to ensure they meet the new regulations. With respect to the manufacturing of tobacco products, only one manufacturer provided a cost estimate that may reflect these activities. This estimate was included in estimating the compliance costs above. As such, and to avoid double counting, no additional cost estimate was included in the RBM. With respect to any ongoing education activities, it is considered normal efficient business to train new staff or provide ongoing training support. Given that the additional training for tobacco plain packaging (in this ongoing setting where other areas of training are provided) is likely to be non-substantive, no ongoing education costs have been included in this analysis. This is consistent with the submissions provided which do not include an ongoing education cost estimate.

Education Activities (Retail)

In 2004, there were an estimated 35,000 tobacco retailers in Australia down from an estimated 40,000 tobacco retailers in 1997/98 (PricewaterhouseCoopers, 2005). In 2012, 35,000 information kits were sent to tobacco suppliers by the Department of Health. As such, for this analysis an estimate of 35,000 retailers was used to estimate total tobacco retail costs. This may be a slight overestimate of the actual number of tobacco retailers in 2015 where there is evidence of a downward trend in the number of tobacco retailers. Where the number of retailers is in fact less than the 35,000 estimate used in this report, the estimated cost to the retail industry will therefore be an overestimate of the true cost.

Based on the online survey completed by 48 retailers, 30% of those who participated declared that they had undertaken additional education activities associated with the TPP measure. Whilst it is possible that all participating retailers undertook some level of educational activities, not just 30%, it is likely that the other 70% of the retailers who participated did not consider tobacco plain packaging to be associated with substantive training over and above that undertaken with respect to changes in regulations regarding display of stock at the point-of-sale, and changes to health warning requirements. Of those that did undertake education

⁴ This figure is subject to the limitations described on pages 7 to 9 above.

activities, an average of eight staff members per store undertook training for an average of 0.97 hours at an average hourly cost of \$23.93 inclusive of overheads and superannuation (assuming overheads represent 16%, this represents an hourly wage rate of \$20.10). This is consistent with the estimates provided by representative retail bodies which indicated that: between 1 and 100 checkout operators would require 0.5 hours of training at an hourly rate of between \$18.52 and \$25.01 per store and between 1-3 stock handling personnel would require 2 hours of training at an hourly rate of between \$19.64 and \$35.00 per store. The analysis is based on the estimate of 0.97 hours of training although this is greater than the 0.5 hours included in the industry representative submission. This is likely due to a proportion of survey participants rounding up their estimates of the time taken. Where this is the case this will lead to an overestimate in the cost to the retail industry.

The total cost of retail training is based on 10,500 retailers undertaking training (30% of 35,000 tobacco retailers) and requiring training for eight personnel for an average of 0.97 hours at an hourly cost of \$23.93 (inclusive of overheads). Given that it is normal efficient business for retailers to train new staff or provide ongoing training support, and that the additional training regarding tobacco plain packaging (in this ongoing setting where other areas of training are provided) is likely to be non-substantive, no ongoing education costs have been included in this analysis. The total cost is estimated as \$1.95 million. That is, 10,500 retailers multiplied by 8 personnel multiplied by 0.97 hours of training multiplied by an hourly cost of \$23.93. This estimate is likely to be an over-estimate of the true cost where the number of tobacco retailers in Australia is less than 35,000 and training time less than 0.97 hours.

Retail Transaction Times

Plain packaging of tobacco products is likely to result in a temporary increase in retail transaction times including ordering, stocking and selling. Where tobacco plain packaging takes longer or is associated with increased error (resulting in additional time) compared with previous branded packages, retailers would bear the associated costs of increased staffing. A report by Deloitte commissioned by the Alliance of Australian Retailers (a group financed by Phillip Morris, Imperial Tobacco and BATA) estimated the potential impact of introducing tobacco plain packaging (Deloitte Touche Tomatsu Ltd, 2011b). This research was undertaken prior to the implementation of the TPP measure and was based on a very small survey of retailers (n = 6; of approximately 35,000 tobacco retailers in Australia) and limited to service stations / convenience stores (n=2), tobacconists (n =2) and newsagents (n = 2). Despite the limited sample size, the Deloitte report claimed that tobacco plain packaging would increase time associated with stock management, sales and stock selection errors.

Several peer-reviewed studies have also examined this issue. For example, one simulation study among participants unfamiliar with cigarette packs, suggested that serving staff may adapt quickly to the requirement to distinguish between packs and may be able to serve a standardised pack in about the same time as, or more quickly than, for branded packs (Carter, Mills, Phan, & Bremner, 2012). However, this may not be generalisable to a typical retailer or typical retail environment.

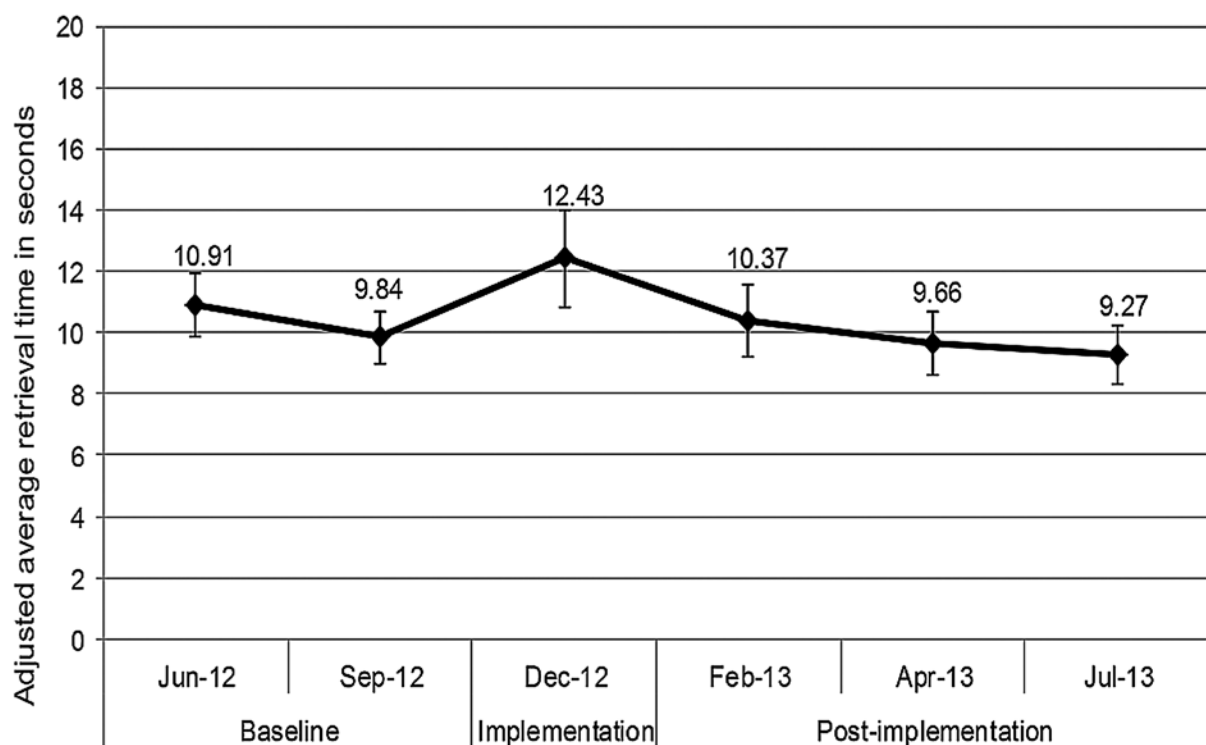
To investigate the impact of tobacco plain packaging on serving times in the retail environment, the Rural Shops Alliance (RSA) commissioned a study (funded by British American Tobacco) comparing serving times in four convenience stores in England during a week with conventional packaging and a week with standardised packaging (Visuality, 2012). The study found that, in the control week, selection time and total transaction time

were estimated at 11 seconds and 30 seconds, respectively, compared with 28 seconds and 58 seconds under standardised packaging. However, this study was based on a very small sample size (n=4) and a limited duration which is unlikely to identify the long term impact of tobacco plain packaging.

Subsequent studies were undertaken after the measure had been implemented. For example Carter et al., (2013) undertook a study at 100 convenience stores, newsagents, petrol stations and supermarkets in Perth one month before and one month after the introduction of tobacco plain packaging in Australia (Carter, Welch, Mills, Phan, & Chang, 2013). The study found a statistically significant reduction in transaction times. Average transaction times decreased from 8.94 seconds (October 2012) to 7.39 seconds (January 2013).

In two larger peer-reviewed studies (Bayly, Scollo, & Wakefield, 2015; Wakefield, Bayly, & Scollo, 2014), over 300 outlets in Sydney, Melbourne, Adelaide and Perth were recruited with tobacco product retrieval time measured prior to, during, and after the implementation of tobacco plain packaging. Both of these studies found that post-implementation retrieval times were not statistically different from pre-implementation measurements. Whilst product retrieval times were numerically higher during the first month after implementation of the measure, than at baseline (pre-implementation), these differences were not statistically significant (see Figure 1).

Figure 1 Adjusted average pack retrieval duration with 95% CI, by month, controlling for city area SES and store type



Source: Figure 1, (Bayly et al., 2015)

Whilst not a direct measure of the impact of tobacco plain packaging on transaction times, two other recent peer-reviewed studies (Scollo, Coomber, Zacher, & Wakefield, 2015b; Scollo, Zacher, Durkin, & Wakefield, 2014) explored propositions made by the tobacco industry that owing to increased transaction times, customers would switch their location of purchase away from small mixed businesses to large discount outlets such as supermarkets.

Both studies concluded that reporting of purchase from supermarkets did not increase and the percentage purchasing from small business outlets did not decline. Arguably, transaction time increases could therefore be considered from the consumers' perspective to be within the normal expected transaction time associated with face-to-face retail purchasing.

The TPP measure applies exclusively to retail trade and does not restrict the use of colours, logos or other identifiers with respect to wholesale distribution or as the UK policy on standardised tobacco packaging phrases it "within the tobacco trade". Consequently, any additional time with respect to manufacturing and wholesale distribution or by retailers in receiving orders cannot be attributed to the TPP measure per se.

Data from Costing Survey

From the online costing survey, 48 retailers provided responses, with additional cost estimates provided by tobacco retailer representative groups and bodies. Based on the costing survey, 57% of retailers who responded identified increased costs associated with stock handling, retrieval time and returns of products sold incorrectly following the implementation of the TPP measure. Whilst the survey was able to identify these costs, respondents were unable to provide an estimate of the impact or to quantify the increase in transaction times. An estimate was provided by a retail representative body of 45 seconds per transaction, based on anecdotal evidence they received from their members. Based on the proportion of retailers that reported increased transaction times (57%) from the costing survey, the average increase in retrieval time (based on the estimate provided by the retail body) would be 26 seconds (i.e. 57% x 45s). This estimate appears to be a significant overestimate of the increased transaction time relative to the peer-reviewed studies of which have found an average of 2.59 seconds, limited to the one month following implementation. For this analysis, an average of 2.59 seconds per tobacco transaction in the month of December 2012 was estimated based on the peer-reviewed literature and is consistent with the approach adopted in the UK impact assessment of standardised packaging of tobacco products.

An estimated 18.597 million cigarette sticks, 66 million cigars and 1,845.6 tonnes of smoking tobacco was sold in 2012 (Euromonitor International, 2014). In order to estimate the number of tobacco transactions that occurred during the month of December 2012, the following assumptions were made:

- there are 25 cigarettes per cigarette pack;
- 50g of loose tobacco per pouch;
- 71% of cigars are sold individually and remaining cigars are in packs of five (Shanahan & Elliott, 2009);
- customers purchase an average of 1.5 cigarette packs per transaction (Visuality, 2012), 1 pouch of loose tobacco per transaction, 1 cigar/pack per transaction; and
- the total number of transactions are spread evenly across the year.

This results in an estimate of 49,902,667 retail tobacco transactions. Based on an estimate of an average increase in retail transaction time of 2.59 seconds, tobacco plain packaging could be estimated to have been associated with 28,971 hours of increased estimated transaction time during the month of December.

The costing survey also asked the average hourly cost per employee including superannuation and other employee overheads. The average cost per hour was \$23.93. Based on the estimated increased transaction time and the average cost per hour, the total cost of increased

retail transaction time associated with tobacco plain packaging is \$675,555 (\$0.68 million) in the month of December across all tobacco retailers.

In addition, 33% of retailers that responded to the costing survey identified increased costs associated with implementing strategies to mitigate increased time associated with stock handling (e.g. re-organising stock ordering and receiving processes) and transaction times and error (e.g. the use of shelf labels). The average cost for these activities is \$180 per store who undertook such investment (or an average of \$60 across all tobacco retailers). The survey estimates are broadly consistent with the \$78.56 estimate provided by one of the retail representative bodies for small retail stores (1 person x 4 hours x \$19.64 = \$78.56). Based on 35,000 tobacco retailers in Australia with an average cost per store of \$60, the total for one-off costs to retailers would be \$2.1 million.

Increased time was also identified with respect to facilitating stock change over from both the cost survey and stakeholder submissions. However, as the business as usual scenario includes the transition associated with the updated and expanded health warnings (which also requires return of stock and restocking of tobacco products) the incremental cost of these activities due to tobacco plain packaging, over and above business-as-usual, is considered to be nil.

However, to explore the implications of such costs if incurred, a cost associated with additional time for ordering and stocking was explored as an illustrative example. One of the retail representative bodies estimated that, an additional four hours per week were required to refill shoots, order stock, conduct stock-take, receive invoices and mark off stock on arrival. Assuming that the increased time for these activities would follow a similar learning curve as was observed for retail sales (that is approximately four weeks for staff to adjust and return to similar levels prior to the introduction of tobacco plain packaging) and based on similar estimates of tobacco retailers (35,000) and the cost of retail staff (\$23.93) then an illustrative cost of additional time associated with handling plain packaged stock, if there was any, could be estimated as \$13.4 million.

Summary Impact on Retail Transaction Time

The weight of evidence suggests that the TPP measure has not substantively affected retail transaction time with respect to product retrieval in the long term. One of the reasons for no lasting effect has been due to the investment in other activities to mitigate this cost. However, these initial investments as well as the increased transaction time during a short period of adjustment to tobacco plain packaging represent a cost to tobacco retailers. The estimated total impact across all tobacco retailers from increased transaction and handling times is estimated as \$2.78 million (equal to \$2.1 million for one-off costs plus \$0.68 million for increased time during transition). This was borne in the first 12 months after introducing tobacco plain packaging and therefore also reflects the present value of this cost.

Total Regulatory Burden

A summary of the total regulatory burden is presented in Table 2.

Table 2 Summary of regulatory burden⁵

Business	Category	Type	Value
Manufacturers, wholesalers and Importers (n≈25)	Purchasing (Plant and Machinery)	Start-up cost	\$11.42 million
	Compliance (Packaging)	Start-up cost	\$57.73 million
Retailers (n≈35,000)	Education	Start-up cost	\$1.95 million
	Compliance (transaction time)	Start-up cost	\$2.78 million
Total			\$73.87 million⁶
Total per business			\$2,109

The total regulatory burden is estimated as \$73.87 million. Based on an estimated total of 35,025 businesses, the average total regulatory cost per business is \$2,109. These costs are all considered one-off with no substantive ongoing costs associated with the TPP measure. As such, the above cost also reflects the total cost over ten years. As such, the average annual cost over ten years per business is \$211. These estimates are relative to a business as usual scenario which includes compliance costs associated with the implementation of changes to the display of tobacco products and graphic health warnings. In addition, whilst education activities are typically ongoing with respect to staff turnover, it is assumed that the inclusion of tobacco plain packaging education along with the usual efficient business operation of staff training is not substantive.

The regulatory burden and cost offset estimate is provided in Table 3.

Table 3: Regulatory burden and cost offset estimate table⁷

Average annual regulatory costs (from business as usual)

Change in costs (\$ million)	Business	Community organisations	Individuals	Total change in costs
Total, by sector	\$7.39 ¹	None identified	None identified	\$7.39
Cost offset (\$ million)	Business	Community organisations	Individuals	Total cost offsets
Total, by sector	Not applicable	Not applicable	Not applicable	Not applicable

¹ Equal to 73.87 million / 10 = 7.39 million

The format of this table is mandated in OBPR guidelines; however, it is not necessary to identify cost offsets across the portfolio in a PIR. No regulatory costs to community organisations or individuals were identified with respect to this regulation.

Based on a time frame of ten years, in line with the OBPR guidance note for RBM, the average annual cost of the tobacco plain packaging regulation is \$7.39 million.⁸ However, all cost submissions received were estimated one-off costs only that were transitional in nature.

⁵ The figures in this table must be read subject to the limitations described on pages 7 to 9 above.

⁶ Does not sum to values in table due to rounding. This figure is subject to the limitations described on pages 7 to 9 above.

⁷ The figures in this table must be read subject to the limitations described on pages 7 to 9 above.

Analysis of Costs and Benefits

Evidence of TPP Efficacy

Subsection 3(1) of the TPP Act sets out the “general objectives” of improving public health by reducing people's use of and exposure to tobacco products, and carrying out Australia’s obligations under the World Health Organization Framework Convention on Tobacco Control (FCTC). Subsection 3(2) provides that the tobacco plain packaging measure is intended to “contribute to” achieving these general objectives “by regulating the retail packaging and appearance of tobacco products” through three specific mechanisms: reducing the appeal of tobacco products to consumers; increasing the effectiveness of health warnings; and reducing the ability of the retail packaging of tobacco products to mislead consumers as to the harmful effects of smoking and using tobacco.

This section reviews some of the literature on the effectiveness of the TPP measure to achieve its stated objectives, through the mechanisms identified in the TPP Act. Following the implementation of tobacco plain packaging in Australia, a number of studies have assessed the impact of tobacco plain packaging on appeal, warning salience, and misleading consumers about the harm of tobacco products.

In general, studies showed that tobacco plain packaging reduced the appeal of tobacco products. In Australia, research has shown that tobacco plain packaging has reduced the appeal of cigarettes among brand-loyal cigarette smokers and most smokers disliked their packs of cigarettes in the year following tobacco plain packaging (Wakefield et al., 2015; Wakefield, Hayes, Durkin, & Borland, 2013; White, Williams, Faulkner, & Wakefield, 2015b).

Studies also showed that tobacco plain packaging was more effective in promoting health warnings. Australian studies found that following the implementation of tobacco plain packaging, individuals were more likely to notice the health warnings label and more likely to think about the health risks of smoking (Borland, Savvas, Sharkie, & Moore, 2013; Wakefield et al., 2015; Yong et al., 2015). Studies also showed that individuals agreed with the health statements reflecting diseases or conditions featured in health warnings displayed on tobacco products (White et al., 2015b).

Further, studies suggested that graphic health warnings on tobacco plain packaging appeared to provide more motivation to quit (Brennan et al., 2015; Wakefield et al., 2015; Wakefield et al., 2013; Young, Currow, & Dunlop, 2014). Finally, studies mostly suggested that tobacco plain packaging reduced the level of false belief about the harmfulness of different brands (United States Department of Health and Human Services, 2012). Research found that variant descriptors systematically influenced individuals’ perceptions of tobacco products (Borland & Savvas, 2014) and following tobacco plain packaging implementation, more smokers believed brands did not differ in harmfulness (Wakefield et al., 2015).

In addition to reducing the appeal of tobacco products to consumers, increased effectiveness of health warnings on tobacco products, and reduced ability of the retail packaging of tobacco products to mislead consumers about the harmful effects, there is evidence that a greater proportion of smokers considered quitting smoking following the implementation of tobacco plain packaging (Brennan et al., 2015).

⁸ This figure is subject to limitations described on pages 7 to 9 above.

Moreover, a study of cigarette pack display and smoking at outdoor venues before and after implementation of the TPP Act found that visible pack display declined by 15% and active smoking dropped by 23% (Zacher et al., 2014). As such, the TPP Act may not only be associated with reductions in the prevalence and consumption of tobacco in Australia but also with reducing the extent to which smokers expose non-smokers to tobacco smoke (above and beyond any reduced exposure to non-smokers from reduced prevalence and consumption).

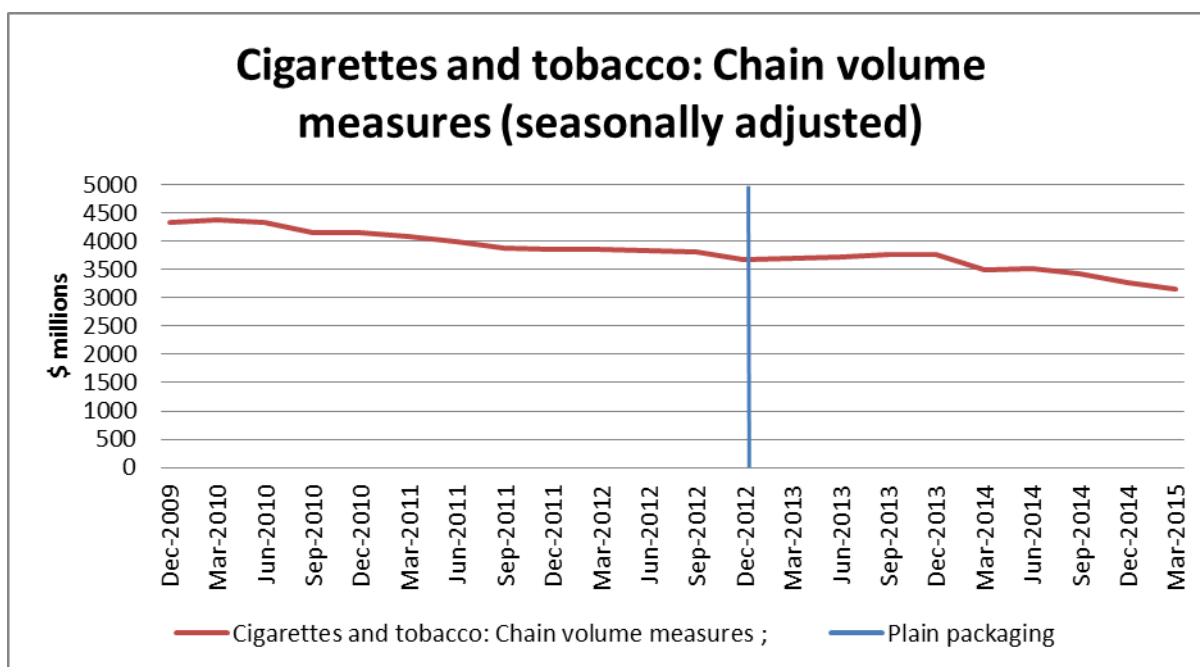
Whilst the above may be considered intermediate outcomes, they are also, and importantly, precursors and potential predictors of change in prevalence. For example, in the 2012 US Surgeon General's report it states that: "According to many theoretical models of behaviour...behavioural intentions are immediate precursors to behaviour and are one of the strongest predictors of future behaviour" (A Report of the Surgeon General, 2012).

As these sources suggest, and as identified within the TPP Act, the achievement of the short-term objectives (the mechanisms under subsection 3(2) of the Act) which relate to knowledge, beliefs, attitudes and intentions should be strongly associated with the achievement of longer-term outcomes in public health (under subsection 3(1) of the Act). There is strong empirical evidence on the three specific mechanisms described above (and under subsection 3(2) of the Act), which suggests that the achievement of these objectives are the direct means by which tobacco plain packaging is intended to contribute to the objective of improving public health described under subsection 3(1) of the Act.

Three sources available to Siggins Miller were identified to assess the change in tobacco smoking prevalence or consumption since the introduction of plain packaging. Namely, ABS quarterly estimates of tobacco expenditure, National Drug and Alcohol Strategy Household Survey (NDSHS), and the Commonwealth Treasury clearances data. The National Health Survey in Australia also collects information on tobacco consumption. However, the latest available wave at the time of writing this analysis of costs and benefits was 2007-2008 and since this was before the implementation of plain packaging, the data is not applicable here.

First, the ABS estimates household expenditure on tobacco on a quarterly basis. Figure 2 below presents the chain volume measure for cigarettes and tobacco for the period 2009-2015. To estimate household expenditure on tobacco, the ABS uses aggregate sales data from relevant suppliers and deflates their values using a single price index for the cigarette and tobacco expenditure category. Over the period December 2012 to 2014, the chain volume measure (seasonally adjusted) of household consumption for cigarettes and tobacco declined by 14.4%.

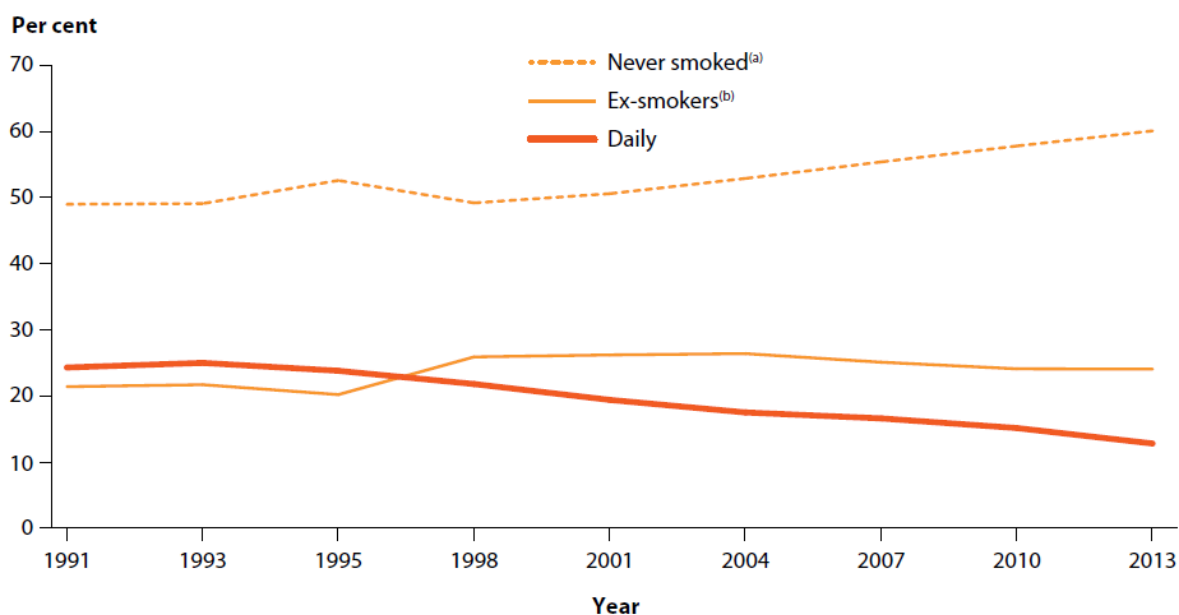
Figure 2: Cigarettes and tobacco chain volume measures of expenditure



Source: Australian National Accounts, Cat. No. 5206.0 (Australian Bureau of Statistics, 2015)

Second, the AIHW used data from the NDSHS to estimate various smoking rates. Figure 3 below presents tobacco related behaviour since 1991.

Figure 3: Tobacco behaviour since 1991



(a) Never smoked 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco.

(b) Smoked at least 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco in their life, and reports no longer smoking.

Source: Table 3.1.

Source: National Drug Strategy Household Survey, 2014

The latest data for the NDSHS was collected in 2013. Previous NDSHS surveys were conducted in 1985, 1988, 1993, 1995, 1998, 2001, 2004, 2007, and 2010. The 2013 data included 23,855 Australian respondents. Figure 3 shows that smoking rates have been decreasing steadily since 1993. The proportion of both males and females aged 14 or older who smoked daily declined between 2010 and 2013. In 2013, 12.8% of Australians aged 14 or older were daily smokers, declining from 15.1% in 2010.

Third, the Commonwealth Treasury has further advised that tobacco clearances (including excise and customs duty) fell by 3.4% in 2013 relative to 2012 (when tobacco plain packaging was introduced) and have subsequently fallen a further 7.7% in 2014 (Department of Health, 2015). Clearances are an indicator of tobacco volumes in the Australian market.

Despite the above evidence that smoking prevalence and consumption of tobacco products have fallen since the introduction of the TPP measure, a number of limitations made it difficult to attribute this decline solely to the TPP measure. Firstly, the TPP measure was introduced simultaneously with increased graphic health warnings and this is difficult to disentangle the effect of plain packaging from any effects resulting from changes to health warnings. Secondly, there is an underlying trend for reduced tobacco consumption and prevalence. Thirdly, in the case of expenditure data, whilst chain-volume measures are estimated by the ABS to better reflect changes in quantity (as opposed to both changes in price and quantity), expenditure remains an imperfect measure of changes in quantity. Fourthly, during the data collection period of the 2013 NDSHS (31 July – 1 December 2013), it was announced that a four staged tobacco excise increase would be implemented. Fifthly, analyses of tobacco consumption and smoking prevalence are limited by a pre-post design. Changes in other determinants of smoking (such as income and population socio-demographics) over the study period may also confound the observed relationship that consumption and prevalence have fallen after the introduction of the TPP measure. As such, this was not possible, based on the materials available to Siggins Miller, to quantify with confidence the effects of plain packaging by itself on smoking prevalence and tobacco consumption.

Despite these limitations, a recent review of the evidence of plain packaging in Australia identified that whilst reductions in smoking prevalence after the introduction of tobacco plain packaging “cannot be directly attributable to plain packaging alone, they are strongly suggestive that plain packaging is contributing to decreases in smoking at the population level” (p.26) (Smith, Kraemer, Johnson, & Mays, 2015). This finding is consistent with the evidence that the introduction of the TPP measure has reduced the appeal of tobacco products to consumers, increased effectiveness of health warnings on tobacco products, and reduced the ability of the retail packaging of tobacco products to mislead consumers about the harmful effects of smoking.

Measurement and Valuation

Health Benefits

Evidence shows that not smoking and quitting smoking have both short- and long-term health benefits for men and women of all ages. Quitting smoking reduces risk of diseases caused by smoking and improves health in general (The National Tobacco Campaign, 2012). Studies have shown that quitting can reduce the level of carbon monoxide in the blood and after 24 hours, the level of oxygen in the bloodstream improves. Quitting also improves the sense of taste and smell and it improves blood pressure and immune system functioning. Within two months of quitting, the lungs stop producing extra phlegm caused by smoking and within a

year of quitting, the mortality risk associated with heart disease decreases significantly. Quitting smoking significantly reduces the risk of developing lung disease and the risk of heart attack and stroke (Jang et al., 2010).

Looking at the social cost of tobacco to the Australian society, it was estimated that in 1998/99, the total social cost of tobacco was \$25,500 million, increasing to \$31,486 million in 2004/05 (Collins & Lapsley, 2008). The social cost of tobacco increased by 23.5% between 1998/99 and 2004/05. Of the total estimated social cost, it was estimated that 38% were tangible costs. Tangible costs included lost productive capacity due to premature death or smoking-associated illness, health care for smoking-associated illness, fires attributable to smoking, and consumption of tobacco products. The remaining 62% were intangible costs and included psychological costs of premature death incurred by family and friends and loss of enjoyment of life (Collins & Lapsley, 2008).

More recently, in a report for the Cancer Council in Western Australia, it was estimated that in 2009/10, the total direct health care costs attributable to smoking was \$202.1 million with \$93.7 million attributed to hospital costs, \$53 million attributed to nursing homes, \$37.3 million attributed to medical services, and \$14.9 million attributed to pharmaceutical products (Collins & Lapsley, 2014). The report also estimated the costs of lost productivity associated with smoking and found that the total net production cost of smoking was \$862.1 million in 2009/10 in Western Australia. The report estimated the total social costs of smoking, and for the year 2009/10, estimated the value of loss of life in Western Australia at \$1,697 million. Finally, the report estimated that the present value in 2009/10 of the social benefit of a reduction in smoking prevalence in Western Australia from 15.6% to 10% over 15 years was most likely to be around \$14,000 per smoker (Collins & Lapsley, 2014). For the purpose of this report we have not undertaken an analysis to quantify the marginal health care cost savings associated with the TPP measure.

A reduction in premature mortality due to smoking is most likely to result in significant cost-savings. Almost 90% of the lost productive value due to excess mortality by smokers could be saved by quitting smoking (Kiiskinen, Vartiainen, Puska, & Pekurinen, 2002). To analyse the costs and benefits of the measure, the health benefits of smoking cessation on mortality are therefore relevant. The strongest evidence for this comes from three studies:

- A four-year follow-up of 204,953 Australian individuals recruited via the 45 and Up Study (Banks et al., 2015);
- A 50-year follow-up of 34,000 British male doctors first studied in 1951 (Doll, Peto, Boreham, & Sutherland, 2004); and
- A seven-year follow-up of 113,752 American women and 88,496 American men over the period 1997-2004 (Jha et al., 2013).

An Australian population study recruited men and women aged 45 and over residing in NSW in 2006-08 (Banks et al., 2015). Data from study participants were linked to the NSW Register of Births, Deaths and Marriages up to 30 June 2012 to provide data on mortality. Banks (2015) used a sample of 204,953 Australians, with 7.7% being current smokers at baseline, and 34.1% past smokers. Around 67% of the individuals were aged 45-64 years and this proportion was higher for current smokers compared with past smokers (82% of current smokers were aged 45-64 years compared with 65% in past smokers).

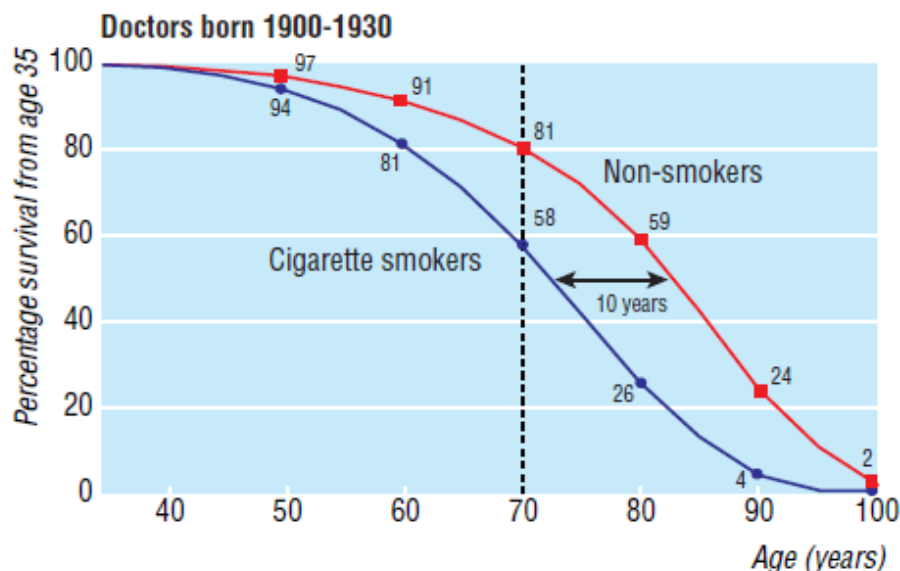
The study compared mortality rates of smokers and never-smokers. The results suggested that starting from age 45, the mortality rate for smokers by age 75 was estimated at 44.6% for men and 33.0% for women compared with 18.9% and 12.2% respectively for non-smokers.

The study found that current smokers were estimated to die an average of 10 years earlier than non-smokers. The study also found that among current smokers, the mortality rate increased markedly with the number of cigarettes smoked per day. For instance, mortality increased by two-fold in the groups smoking 14 or fewer cigarettes per day and around four-fold in the groups who smoke more than 25 cigarettes per day, compared with never-smokers.

The study by Doll (2004) compared the hazards of cigarette smoking in British men and the extent of the reduction in risk when cigarette smoking was stopped at different ages. The study used data from 1951 to 2001 of 34,439 male British doctors. The primary outcome of the study was overall mortality by smoking habit. The study assumed that the excess overall mortality among participants identified as smokers was an approximate measure of the excess mortality actually caused by smoking. The results showed that for doctors born between 1920 and 1929, the probability of death in middle age (35-69) was 43% for smokers compared with 15% for lifelong non-smokers. The excess mortality was higher than in the groups of doctors born between 1910 and 1919 and those born in 1900-09.

When considering the complete cohort, the results suggested a shift of about 10 years between the overall survival patterns of the continuing smokers and the lifelong non-smokers in doctors born between 1900 and 1930. The study also showed that overall mortality rates differed greatly between lifelong non-smokers and continuing cigarette smokers. For instance, the mortality rate for the 45-54 years was about 0.38% for non-smokers compared with 0.85% for smokers. Similarly, the mortality rate for 65-74 years was 1.9% for non-smokers compared with 5.1% for smokers.

Figure 4: Survival from age 35 for continuing cigarette smokers and lifelong non-smokers among UK male doctors born 1900-1930, with percentage alive at each decade



Source: (Doll et al., 2004)

Finally, a similar analysis comparing the mortality rates of smokers and non-smokers in the USA was also assessed (Jha et al., 2013). The study included adults recruited via the USA National Health Interview Survey between 1997 and 2004 whose records were linked to the National Death Index. The study identified former smokers as adults who had smoked at least 100 cigarettes in their lifetime but had not smoked within the previous five years. Never

having smoked individuals were those who had smoked fewer than 100 cigarettes in their lifetime. The study sample consisted of 113,752 women and 88,496 men who were followed for seven years on average. The results suggested that a person who had never smoked was about twice as likely as a current smoker to reach 80 years of age. The rates differed between women and men. Among current smokers, survival was about 11 years shorter for women and about 12 years shorter for men, compared with individuals who had never smoked.

The Jha et al., (2013) study also looked at the benefits of smoking cessation. The results suggested that the greatest benefits were when cessation occurred at a younger age. For smokers who quit at 25 to 34 years of age, they would gain about 10 years of life compared with those who continued to smoke. Smokers who quit smoking at 35 to 44 could expect to gain about nine years of life compared with those who continue to smoke. Finally, smokers who stopped smoking at 45 to 54 years and 55 to 64 years gained about six and four years of life respectively.

Consequently, where tobacco plain packaging as part of broader tobacco control policies results in reduced uptake, increased quit rates or reduced consumption of tobacco and/or reduced relapse rates for those who quit, substantial health benefits at both an individual and population level will be achieved. It is possible to estimate the value of this potential health benefit using Australian Life Tables (Australian Bureau of Statistics, 2014b), estimates of the prevalence of smoking from the NDSHS (Australian Institute of Health and Welfare, 2014) and estimates of the relative risk of death for current smokers and former smokers (Doll et al., 2004). Importantly, this analysis accounts for quit rates observed in the absence of the tobacco plain packaging measure. That is, those who quit smoking following the implementation of the tobacco plain packaging measure, may have otherwise quit smoking over the course of their life.

For the purpose of this analysis, the following assumptions are made with respect to the relative risks sourced from the scientific literature as that research does not report results for all ages:

- The relative risk of smokers aged Under 35 is 1;
- The relative risk of those who quit Under the age of 35 is 1;
- The relative risk of those the same age as the age they quit is the same as a smoker of that age; and
- The relative risk of smokers aged 85 and over is 1.

These assumptions are consistent with those made in the UK impact assessment of standardised tobacco packaging. These assumptions are likely to overstate the relative risk for quitters resulting in slight underestimates of life years saved for adult quitters and slight overestimates of life years saved for children.

Based on revised age-specific mortality rates for non-smokers, quitters (by age of which they quit) and lifelong smokers, corresponding life-tables were constructed following accepted methods (Chiang, 1984) and are consistent with the approach adopted in the UK impact assessment. Table 4 provides the estimated life years lived for those turning 16 (average age of smoking initiation) based on lifetime smoker status.

Table 5 provides the estimated life years lived for five adult age categories based on potential future quit ages.

Table 4: Life years lived from now for someone turning 16 by life-time smoker status

Life-time smoker status	Life years
Never smoker	67.79
Quit under 35	67.79
Quit 35 to 44	66.71
Quit 45 to 54	63.56
Quit 55 to 64	62.24
Lifelong smokers	61.05
All persons	66.47

Table 5: Life years lived from now by age and age at which they quit smoking

Quit Age	Smoker age				
	18-34	35-44	45-54	55-64	65+
Under 35	59.02				
35 to 44	57.94	43.52			
45 to 54	54.78	40.32	31.21		
55 to 64	53.45	38.98	29.83	21.55	
Lifelong smokers	52.26	37.77	28.60	20.23	13.11
Never smokers	59.02	44.50	34.99	25.84	17.25

The above estimates may be an underestimate of the potential increase in life years given they were derived based on a UK study (Doll et al., 2004) which reports a lower relative risk of death for current and former smokers compared with recently published Australian estimates (Banks et al., 2015) albeit the Australian estimates are based on shorter period of follow up and restricted to those aged 45 and above.

Based on estimates of the proportion of smokers who quit at various age categories or are lifelong smokers, it is possible to estimate the average (or expected) life years saved by a child turning 16 years who does not initiate smoking or by a smoker (at various ages) who quits smoking as a result of an intervention. Specifically, this is estimated as the weighted average of the life years saved by smoker status (weighted by the age-specific proportions that otherwise would have quit by quit age or are lifelong smokers). A monetary value for one additional life year of \$182,000 was applied to monetise this health benefit. This value is recommended by the OBPR in their guidance note on the value of statistical life, and inflated. This resulted in 2.27 life years per smoker avoided with a monetary value of \$412,629 and between 1.06-3.00 life years per quitter (depending on current age of the smoker) with a monetary value between \$195,548 and \$546,386. Finally, as these increases in life years occur in the future (i.e. at the point at which they would have otherwise died), these estimates were discounted using a 7% discount rate, consistent with the OBPR guidance note for conducting cost-benefit analyses.

Between 2010 and 2013, the prevalence of daily smokers aged 14 and older decreased by 2.3% (estimated to be equivalent to 437,855 fewer current smokers⁹). This period included the introduction of the TPP Measure. As noted previously, a recent review of the evidence of tobacco plain packaging concluded that although this change cannot be directly attributable to

⁹ Estimated using the 2010 prevalence of smokers aged 14 and older compared to the prevalence of smokers aged 14 and older in 2013 (Australian Institute of Health and Welfare, 2014) based on the Australian population estimates for those aged 14 and older in 2013 (Australian Bureau of Statistics, 2014a)

plain packaging alone, it was one indicator identified as contributing to decreases in smoking at the population level (Smith et al., 2015).

As an illustrative example, a half percent reduction in the number of current smokers aged 12 years and older (estimated as 3,011,467) is equal to a reduction of 15,057 current smokers¹⁰. This is equivalent to a reduction in prevalence of current smokers aged 12 years and older of 0.07 percentage points. This would translate to 30,318 additional life years¹¹ with an estimated discounted monetary value of \$363.2 million.¹² If the drop was evenly distributed over the ten year period recommended for policy evaluation by the OPBPR, its discounted monetary value is estimated at \$273 million. Indeed, a drop as small as 0.102% (equivalent to approximately 3,060 people or a 0.013 percentage point reduction in prevalence) is estimated as exceeding the estimated regulatory burden of \$73.87 million.¹³

In addition to the potential health benefits for current smokers, the TPP measure may have an ongoing impact on the uptake of smoking for each subsequent cohort of potential smokers (i.e. those currently aged less than 12 years). For example, a half per cent reduction in those who are estimated to take up smoking in the next year (i.e. currently aged 11) is equal to approximately 70¹⁴ persons each and every subsequent year¹⁵. This would translate to an additional 160¹⁶ life years each and every year after the introduction of the TPP measure. This has an estimated undiscounted monetary value of \$29.1 million.

These monetary estimates of health benefits are considerably less than those estimated in the impact assessment of standardised tobacco plain packaging conducted in the United Kingdom. This difference is due to three fundamental differences in the illustrative analysis provided here and the one conducted in the UK. First, this analysis was based on a half per cent reduction in current smokers whereas the UK study was based on 3.8 percent reduction. Second, a discount rate of 7% was used in this study compared with a discount rate of 1.5% used in the UK study. Given the preventive nature of the tobacco plain packaging measure as well as the timing of when such health benefits would accrue, any estimate of health benefits will be heavily sensitive to the choice of discount rate applied. Third, the population of smokers in the UK is substantially higher than in Australia. Consequently, the total health benefits at a population level will be reflective of underlying differences in the magnitude of populations for which the policy applies to.

¹⁰ Estimated as a one half percent reduction (uniform across all age groups) in the estimated number of current smokers where current smokers was estimated based on 2013 Australian population (Australian Bureau of Statistics, 2014a) multiplied by the age specific prevalence estimates of current smokers (Australian Institute of Health and Welfare, 2014)

¹¹ Estimated by multiplying the reduction in current smokers (15,057) by the age-specific increases in life expectancy (1.06-3.00 life years per quitter).

¹² Calculated by multiplying the estimated life years (30,318) by the value of an additional life year. The value of an additional life year is equal to the WTP per life year (\$182,000, discounted at 7% per annum relative to the age-specific timing in which this additional life year would occur (i.e. age-specific life-expectancy for a smoker adjusted by predicted future quit rate).

¹³ This figure is subject to limitations described in pages 7 to 9 above.

¹⁴ Estimated as one half percent of those aged 11 (Australian Bureau of Statistics, 2014a) in 2013 multiplied by the prevalence of current smokers in 12-17 year olds (Australian Institute of Health and Welfare, 2014)

¹⁵ Assuming constant population and that the half per-cent reduction in those who become a current smoker is maintained

¹⁶ Calculated as reduction in current smokers multiplied by 2.27 life years (the estimated increase in life expectancy per smoker avoided adjusted for otherwise observed future life-time quit rates)

It should also be noted that any change in behaviour of smokers which reduces smoking also results in a reduction in exposure to tobacco smoke among non-smokers (including foetal exposure) – with further health benefits attached. The above estimates do not include any health benefits from this reduced exposure. Importantly, the TPP measure may not only have contributed to reduced exposure to tobacco smoke among non-smokers from a reduced prevalence of smokers, but evidence indicates that the TPP measure may also have changed smoking behaviours at outdoor venues (cafes, restaurants, bars with outdoor seating). Active smoking dropped by 23% at outdoor venues after implementation of the TPP measure with the proportion of packs concealed also increasing (Zacher et al., 2014). As such, irrespective of changes in prevalence of smoking attributable to the TPP measure, the TPP measure may also have reduced exposure to tobacco smoke from changing smokers behaviour around non-smokers. The health benefits from reduced tobacco exposure among non-smokers are not included in the above example and therefore the above monetary value of the potential health benefits of the TPP measure is likely to be underestimated.

Box 1: Summary Impact on Health

Smoking strongly increases the risk of disease and mortality. Studies have consistently shown that not smoking or quitting is associated with increased life expectancy.

Peer-reviewed publications regarding the impact of tobacco plain packaging suggest that there has been a statistically significant impact associated with intermediate outcome measures including reducing the appeal of tobacco products, increasing the effectiveness of health warnings on tobacco product packaging, and reducing the ability of the packaging to mislead consumers. Where tobacco plain packaging, as part of broader tobacco control policies, results in reduced uptake of tobacco consumption, increased quit rates or reduced consumption of tobacco and/or reduced relapse rates for those who quit, substantial health benefits at both an individual and population level will be realised.

For example:

A reduction in current smokers (aged 12 years and above) by one half percent is equal to 15,057 persons. This would translate to 30,318 additional life years with an estimated discounted monetary value of \$273million, if the drop is evenly distributed over the 10 year horizon as specified by the OBPR.

In addition to the potential health benefits from current smokers, the TPP measure will have an ongoing impact on the uptake of smoking for each subsequent cohort of potential smokers (i.e. those currently aged 11). A half per cent reduction in those who are estimated to take up smoking in the future is equal to 70 persons each and every subsequent year. This would translate to an additional 160 life years each and every year after the introduction of the TPP measure.

Finally, the TPP measure may also have reduced exposure to tobacco smoke from changing smokers' behaviour around non-smokers (Zacher et al., 2014). The health benefits from reduced tobacco exposure among non-smokers are not included in the above example and therefore the above monetary value of the potential health benefits of the TPP measure is likely to be underestimated.

Consumer Surplus

Consumer surplus is an economic principle that is commonly included in cost-benefit analyses. Consumer surplus can be defined as the difference between consumers' willingness to pay for a product and the actual price they pay. Consequently, regulatory actions that reduce the demand for a product (i.e. reduce consumer willingness to pay for a product over all quantities) or that increase its market price will lead to reductions in consumer surplus. More applicable in the case of tobacco plain packaging where a desired feature of a product is removed, the willingness to pay for that product is reduced and consequently generates a loss in consumer surplus.

The orthodox approach in Cost-Benefit Analysis is to account for this loss in consumer surplus. However, accounting for consumer surplus in Cost-Benefit Analysis is based on a rational model of consumer behaviour which does not reflect the fact that addiction is a major factor in tobacco use. The orthodox approach assumes that time consistent decisions (i.e. appropriately consider future consequences) are made by individuals who are fully informed about the health consequences of smoking, including addiction, and who appropriately act on this information (Chaloupka et al., 2015). However, in the case of tobacco products, this theory of rational behaviour and trade-offs is not appropriate.

Many smokers do not make time consistent decisions, due to either present bias or projection bias (Chaloupka et al., 2015). Present bias is the tendency to systematically overvalue immediate costs and benefits relative to those in the future, leading to impulsivity and limitations on self-control (Laibson, 1997). Projection bias is the tendency to under-estimate how much a person's preferences will change in the future. That is, smokers may underestimate the degree to which they will value being smoke-free in the future (Loewenstein, O'Donoghue, & Rabin, 2003). Moreover, many smokers are not fully informed with respect to the associated health risks of smoking (Grey, Hoek, & Edwards, 2014; World Health Organisation Framework Convention on Tobacco Control, 2008); or with respect to addiction. A review of standardised tobacco plain packaging conducted for the UK government notes, "addiction to nicotine involves multiple processes, with evidence suggesting adolescents can experience a loss of autonomy very soon after the first cigarette" (p. 3) (Chantler, April 2014). Most notably, a US study of high school seniors found that only 3% of those smoking daily thought that they would definitely be smoking in five years, whereas almost two-thirds were still smoking seven-to-nine years later (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2013).

In Australia, the difficulty of making rational decisions which involves a trade-off between short-term gain and long-term consequences is recognised. For example, the sale of tobacco and alcohol or the provision of credit, are prohibited to those aged below 18 years. That is, below 18 is considered an age of 'insufficient reason' (Chaloupka et al., 2015). However, the average age of smoking initiation is 15.9 years in Australia (Australian Institute of Health and Welfare, 2014). As such, within Australia it is unlikely that decisions regarding smoking constitute rational decisions by persons who are fully informed about the health consequences of smoking tobacco, including its addictiveness.

Time inconsistent preferences, information asymmetry and loss of autonomy abate the notion of consumer surplus for tobacco products. Within Australia 89.6% of smokers agreed or strongly agreed with the statement "If you had to do it again, you would not have started smoking" (Fong et al., 2004). Moreover, nearly seven out of every ten smokers reported that they wanted to quit smoking completely and more than half of all smokers stopped smoking

for at least one day because they were trying to quit smoking. (Centers for Disease Control and Prevention, 2011). As such, there may be a gain in consumer surplus for those whose unrealised preferences for quitting are now realised, even above the value of any health gain. As such there are reasonable grounds (Gruber & Koszegi, 2008; Weimer, Vining, & Thomas, 2009) to assign to these individuals a benefit equivalent to their reduction in expenditure on tobacco, which is expected to be spent on other goods and services.

Finally, the reduced value to consumers of branding or brand appeal must also be considered. Brand appeal is thought to be something that people are willing to pay for when they purchase cigarettes and probably proportionally more with respect to premium brands. Restricting packaging does not eliminate the market for premium brands. However, the conspicuous consumption of a premium product will be inhibited. On the other hand, it may also represent a gain to those who felt their consumption was made less enjoyable, or were made to feel inferior, by the conspicuous consumption of premium products by others. Thus, branding can be seen as a zero sum game. Moreover, as discussed below, the Australian economy is dynamic, with consumers able to substitute alternative premium branded non-tobacco products to compensate for any lost utility associated with plain packaged tobacco products.

Consequently, tobacco plain packaging is not likely to result in a significant net gain or loss in consumer surplus associated with reduced brand appeal. This is consistent with the Impact Analysis of standardised tobacco packaging conducted in the United Kingdom.

Box 2: Summary Impact on Consumer Surplus

On evaluation, tobacco plain packaging is not likely to result in a substantive net change in consumer surplus (either gain or loss).

Loss of consumer surplus is not an appropriate consideration with respect to tobacco control interventions. That is, the instances in which it is likely to be applicable are limited and offset by gains from the majority of smokers whose true preference is to reduce or stop their consumption of tobacco.

There are potential gains in consumer surplus where tobacco plain packaging assists those whose true preference is to quit or reduce their tobacco consumption. This gain in consumer surplus would be equivalent to their increase consumption of other goods and services.

Consumer surplus from reduced branding is likely to be a zero sum gain game with tobacco plain packaging not likely to result in a significant net gain or loss in consumer surplus across smokers or the economy more broadly

Productivity Gains

There is sufficient evidence, both in Australia (Bush & Wooden, 1995) and internationally (Bunn, Stave, Downs, Alvir, & Dirani, 2006; Laaksonen, Piha, Martikainen, Rahkonen, & Lahelma, 2009), to conclude that smokers take more sick leave than non-smokers.

In estimating the costs of tobacco to the Australian society, Collins and Lapsley (2008) estimated the excess absenteeism attributable to smoking (Collins & Lapsley, 2008). They relied on data on employee absences from work during a two week period with Australian estimates of smokers absenteeism relative to non-smokers and never smokers (Bush & Wooden, 1995) and used estimated prevalence of smokers, non-smokers and never smokers from the NDSHS. Following the same approach as Collins and Lapsley (2008) but with the latest NDSHS (Australian Institute of Health and Welfare, 2014) prevalence estimates, ABS

data on absenteeism (Australian Bureau of Statistics, 2003), the excess absenteeism (for ill-health or disability) per smoker (relative to a never smoker) is 1.61 days per year and 1.21 days per year for an ex-smoker (relative to a never smoker). The marginal benefit for a smoker to quit (who otherwise wouldn't have quit), that is an ex-smoker relative to a smoker, is 0.40 days per annum. Based on mean income for employees and business owners (Australian Bureau of Statistics, 2003) inflated to June 2014, this equates to a potential increase in productivity per working smoker avoided of \$337.48 per year and an \$84.37 increase in productivity per working quitter per year.

In addition, Bunn (2006) measured unproductive time at work as well as sick leave for smokers compared with non-smokers (Bunn et al., 2006). More than 45,000 workers from 147 companies in the USA reported the number of work days lost and hours they were unproductive. The average annual cost for lost productivity was about 70% higher for current smokers than non-smokers (\$4430/year versus \$2623/year). Approximately 60% of the productivity losses for smokers were due to unproductive time at work.

Box 3: Summary Impact on Productivity

Preventing smoking or increasing the number of smokers who quit would result in increased productivity gains. The value per working smoker avoided is estimated at \$337.48 per year. The value of the increased productivity per working quitter per year is estimated at \$84.37. This is likely to underestimate total productivity gains from reduced tobacco consumption. To the extent that the TPP measure may contribute to reduced tobacco smoking or exposure to tobacco smoke, there would be increased productivity gains.

Cleaner Streets

It has been previously reported that an estimated 60% of Australian smokers do not dispose of their cigarette butts appropriately when smoking outside with 7.2 billion cigarette butts discarded annually in Australia (Winstanley & Freeman, 2012). Almost 50% of all litter in urban areas is tobacco related including cigarette butts, cellophane wrapping, foil inserts and packaging (Keep Australia Beautiful Queensland, 2015). The cost of clean-up in Australia has been estimated in excess of \$1 billion annually with governments paying approximately 80% and the remaining 20% borne by businesses and other organisations (Keep Australia Beautiful Queensland). In addition, discarded cigarette butts have also been linked with serious environmental consequences (Moerman & Potts, 2011; Slaughter et al., 2011) and health risks (Novotny et al., 2011).

Tobacco products are undoubtedly associated with litter. In turn this litter has economic consequences including reduction in amenity value of public spaces and the cost of cleaning up, and poses environmental and health risks. However, whilst evidence on the quantity of cigarette litter is available from multiple sources and the environmental and health risks have been established in peer-reviewed scientific journals, the source of the cost estimates for litter clean up could not be verified. Moreover, the average cost (and other associated harm) per item of litter is not likely to represent the marginal cost associated with an incremental reduction in litter.

Measures that reduce tobacco consumption are likely to reduce associated tobacco litter but, reductions in consumption of tobacco products are likely to be replaced with consumption of other goods and services. Consequently, any reduction in litter associated with lower tobacco consumption could be offset by increased litter associated with the consumption of substituted goods.

Box 4: Summary Impact on Cleaner Streets

It is plausible that any intervention that reduces tobacco consumption may result in less tobacco related litter. However, the extent to which this is offset by increased litter from greater consumption of other goods remains unknown. As such, no attempt has been made to quantify the potential value from cleaner streets as a result of the introduction of tobacco plain packaging.

Potential Impact on Profit

Within the RBM the potential direct costs to the tobacco industry of complying with the TPP measure were identified and estimated based largely on submissions from industry. These costs included replacement of machinery, capital expenditure associated with factory retrofitting, packaging compliance costs, as well as education activities. These costs were estimated as \$71.10 million and were distributed across 35,025 businesses including, manufacturers, importers, distributors and retailers.¹⁷

In addition to the direct compliance costs associated with the tobacco plain packaging measure considered within the RBM, this section outlines the potential impact on tobacco industry profits. This includes consideration of the potential reduction in tobacco sales, reduction in profitability from changes in consumer preferences away from premium brand tobacco products, impact on value of tobacco brands, and potential for reduced packaging costs. In each case, consistent with OBPR guidance, a societal perspective has been adopted.

Potential Reduction in Future Tobacco Sales

Any reduction in smoking will impact the sales and possibly the profits associated with tobacco products in Australia. No raw data on tobacco sales in Australia was made available by industry for the purposes of the PIR for this analysis and therefore this impact could not be directly analysed in this analysis of costs and benefits.

However, the Australian economy is dynamic with reduced tobacco expenditure highly likely to be reallocated to other industries. The macroeconomic and distributional effects from a hypothetical 25% reduction in the prevalence of smoking in New South Wales have previously been reported (Junor, Collins, & Lapsley, June 2004). This analysis was based on input-output tables to forecast changes in output and employment following a reduction in tobacco expenditure and redistributed throughout the broader economy. The authors concluded (“with great confidence”) that the aggregate affects upon the economy of a decline in smoking prevalence would be largely neutral in their effects on output and employment. This conclusion is largely consistent with similar international studies which considered the net effect on employment after accounting for the redistribution of reduced expenditure on tobacco.

Potential Change in Preferences for Premium Brand Products

In addition to potential reduced sales, evidence suggests that at the time the tobacco plain packaging measure was introduced consumers were substituting high priced tobacco products for cheaper priced tobacco products (Scollo, Zacher, Coomber, Bayly, & Wakefield, 2015). Where this is due to the tobacco plain packaging measure, this could lower the profitability of tobacco sales in Australia. In a media release by British American Tobacco (31 October, 2014) regarding the closure of their Australian factory, BATA stated that the closure of the

¹⁷ This figure is subject to limitations described in pages 7 to 9 above.

facility was due in part to smokers looking for lower priced tobacco because of excise duties (although the release specifically states that tobacco plain packaging was not a factor). Therefore, it is difficult to attribute changes in consumer preferences for lower priced tobacco products to tobacco plain packaging relative to other measures including tax excise.

Additionally, as noted earlier, the Australian economy is dynamic. Consequently, any reduced expenditure from changes in consumer purchasing preferences will be redistributed across the broader economy. Whilst Davidson and de Silva (2014) hypothesise that consumers will increase their tobacco consumption to offset their lost utility (i.e. satisfaction experienced by the consumer of a good) from tobacco plain packaging (Davidson & de Silva, 2014), it is more likely that consumers will redistribute their expenditure into alternative products which provide equivalent utility associated with consumption of premium brand products (Hamilton et al., 2014; Morewedge, Vosgerau, & Eun-Huh, 2013).

Finally, any assessment of potential substitution of high priced tobacco products with low priced tobacco products occurring in Australia is confounded by contemporaneous increases in tobacco prices during the implementation of the tobacco plain packaging measure and an increase in value brand products available for sale prior to the introduction of the tobacco plain packaging measure. Specifically, inflation adjusted prices for cigarettes and roll-your-own tobacco increased prior to and post implementation of the tobacco plain packaging measure (Scollo et al., 2015). Most notably, the relative price increase for high-priced products was greater than the relative price increase for low priced products.

Potential Impact on Value of Tobacco Brands

Brand value enables the tobacco industry to sell tobacco products to consumers (relative to other non-tobacco products) or sell them at a higher price based on the brand characteristics of their products (i.e. above and beyond any difference in other characteristics). If reduced sales or reduced sales of high price tobacco product brands occurred as a result of the tobacco plain packaging measure, it could reduce the value of those brands.

In the impact assessment of standardised tobacco packaging conducted in the United Kingdom, reduced brand value of tobacco manufacturers was estimated based on the potential reduced profit from smokers substituting premium brand tobacco products for economy brand tobacco products and from reduced sales owing to smokers quitting. This was estimated for reduced profits achieved by both manufacturers and retailers. However, whilst it is acknowledged that for members of the tobacco industry, changes in purchasing will impact their profits and in turn the value of their brands, it must also be acknowledged that reduced expenditure on tobacco products will be redistributed throughout the rest of the economy (Junor et al., June 2004). With respect to any substitution of high priced tobacco products for low priced tobacco products, it is likely that the residual expenditure would be used in purchasing of other premium brand products as mentioned above. Consequently, any reduced value of tobacco brands is likely to be offset by increases in the brand values of those products that are substituted in place of tobacco products.

Potential Reduced Packaging Costs

Prior to plain packaging being introduced in Australia, tobacco packaging design included features such as colours, embossing, images, and different structural elements (for example, soft or hard packs and differently sized packs). Tobacco packaging could also utilise other promotional innovations in pack design and style to make the packaging attractive. The measure required tobacco companies to produce a simplified standardised pack.

Europe Economics (2008) reports that the manufacturing costs of a plain package as opposed to a branded package is likely to be lowered. Although not quantified by Europe Economics, another study undertaken in Europe argued that the ongoing administrative burden of introducing plain or generic packaging is ‘probably negative’ because of the lower production costs associated with standardised packaging (Tiessen et al., 2010). Similarly, the impact assessment of standardised tobacco packaging undertaken by the UK Government estimated a possible saving of between 1 and 3 pence per cigarette pack from reduced lower input costs associated with packaging (2012).

Therefore there are good reasons and evidence for supposing that tobacco plain packaging resulted in reduced packaging costs for industry. These are likely to be within the range estimated by the UK assessment – namely, 1 to 3 pence approximately AU 1.5 to 4.5 cents.

As an illustrative example of the potential packaging savings for one year:

- If 18.597 billion cigarettes are sold in any one year,¹⁸ this would be equivalent to approximately 743.8 million packs (assuming 25 cigarettes a pack¹⁹)
- The approximate savings for that year can be estimated at:
 - 1.5 cents x 743.8 million packs = \$11.6 million in savings
 - 4.5 cents x 743.8 million packs = \$33.47 million in savings

As an illustrative example of the packaging saving over a 10 year period:

- If there was a decline in cigarette sales of 3.5%.²⁰ approximately 6.15 billion packs (154 billion cigarettes) would be sold over the 10 year period. The approximate (undiscounted) savings are estimated at:
 - 1.5 cents x 6.15 billion packs = \$92 million in savings
 - 4.5 cents x 6.15 billion packs = \$277 million in savings

This analysis indicates that any per-pack saving on manufacturing cost greater than \$0.01 (assuming an annual decline in cigarette volumes of 3.5% over the next ten years) would offset the regulatory burden calculated above.

Box 5: Summary Impact on Industry Profits

Any reduction in smoking will impact the sales and possibly the profits associated with tobacco products in Australia. However, this is likely to be redistributed among substituted non-tobacco products. Previous analysis of the redistribution of expenditure from reduced smoking prevalence indicates that this would result in no net effect on Australian output or employment. Whilst there is some evidence of smokers substituting high price tobacco products for low price tobacco products in the period after the introduction of the plain packaging measure, contemporaneous price increases and increases in the number of value brand products available, confounds any possible estimation of the contribution that the plain packaging measure has had, if any. In addition, industry media releases suggest that price is more deterministic of any changing in preferences for high price tobacco products than changes under the plain packaging measure. Moreover, any given loss in profit from the substitution to low price tobacco products is likely to be offset by increases in the profit of

¹⁸ As was the case in 2012 according to the 2014 Euromonitor International ‘Tobacco in Australia’ Report. Euromonitor International is a market research company based in London, which provides market information on a number of different industries.

¹⁹ Assuming 25 per pack which is the most commonly sold size. See 2014 Euromonitor Report p.38

²⁰ This is a simplistic assumption on the basis of the Euromonitor Report which reported an annual decline cigarette sales volume of between 3-4% in the year 2011-2014 (p.20). Other data sources regarding tobacco sales volume, such as clearance data, also indicate similar declines. The assumed decline is for the purpose of the illustrative example only and does not attempt to quantify the actual likely future decline in tobacco sales or the potential impact of tobacco control measures more generally.

premium branded non-tobacco products. Whilst any reduced profitability of tobacco products (either from reduced sales or reduced sales of higher profit products) will reduce tobacco brand values, the corresponding increase in profits of non-tobacco products will result in corresponding increases in non-tobacco product brand values.

Finally, evidence indicates that the production cost per pack of cigarettes will likely fall following the introduction of plain packaging. While the exact savings associated with this benefit is not able to be precisely quantified, the illustrative example showed it is likely to be between \$92 million and \$277 million.

Illicit Trade Considerations

During the PIR consultations, a number of tobacco industry stakeholders raised concerns about the possibility of increased illicit trade in tobacco from the introduction of tobacco plain packaging. However, there is considerable debate and discrepancy between available data sources regarding illicit trade of tobacco in Australia.

The illicit trade of tobacco products is driven by a number of supply and demand factors. These include the level of detection and enforcement of criminal charges relating to illicit trade, the penalties imposed on any breach of these laws, the price of legal products, the ease and direct cost of producing and distributing illicit products, economic, and social and cultural factors influencing the acceptability and/or demand for illicit products.

In 2011, a tobacco industry commissioned report on illicit trade of tobacco in Australia claimed that the size of the illicit tobacco market in Australia was 15.9%. (Deloitte Touche Tomatsu Ltd, 2011a). This estimate was based on a very small survey of 949 smokers and estimates were not adjusted to reflect that only 1.5% of smokers used unbranded tobacco half the time or more. Moreover, the estimate was based on large capital cities and assumed reflective at a national level. This would overestimate the national estimate where rates of unbranded tobacco use are 18% higher in capital cities than the rest of the country and 44% higher in Melbourne and Sydney than the rest of the country. As such, Winstanley and Freeman (2012) argue that the estimate of 4.9%, from the NDSHS in 2010, with a sample size of more than 26,000 (and applying sample weights to be representative at a national level), provides a much more reliable estimate than the 15.9% provided in the Deloitte report (Winstanley & Freeman, 2012). However, it must be highlighted that the 2010 NDSHS questions relating to unbranded loose tobacco were modified in 2010 and only asked respondents about awareness and use of unbranded loose tobacco, whereas in 2007 respondents were asked about awareness and use of unbranded loose tobacco and unbranded cigarettes (Australian Institute of Health and Welfare, 2014).

A series of reports by KPMG commissioned by the three major Australian tobacco companies estimated that the consumption of illicit tobacco in Australia as a proportion of total consumption had increased from 11.5% in 2012 to 13.5% in 2013, to 14.3% in June 2014 and 14.5% in December 2014 (KPMG, 2013, 2014a, 2014b, 2015). However, it is not possible to rely on the estimates provided within the KPMG report owing to the express wishes and disclaimer issued by the authors of the reports. Specifically, each report within the KPMG series includes the following (or similar) disclaimer: “... KPMG LLP’s work for the Addressees was performed to meet specific terms of reference agreed between the Addressees and KPMG LLP and that there were particular features determined for the purposes of the engagement. The report should not therefore be regarded as suitable to be used or relied on by any other person or for any other purpose. The Report is issued to all parties on the basis that it is for information only.” (p.1) (KPMG, 2013)

The KPMG series of reports have been criticised on the grounds that the consumer surveys and empty pack survey are not representative, have potential for underestimation of the legal purchase of foreign cigarettes within the online survey, overestimated the amount of tobacco used in roll-your-own cigarettes and underestimated the quantity of rolling papers used for cannabis use as well as potential inconsistencies in study methodologies, sampling frame and study protocols over the report series. In addition, the estimates of illicit tobacco contained in the KPMG report are inconsistent with estimates from the NDSHS (Australian Institute of Health and Welfare, 2014). The 2013 NDSHS of more than 24,000 people found that only 3.6% of those aged 14 years and over currently smoke unbranded tobacco (both unbranded loose tobacco and unbranded cigarettes). This is statistically significantly lower than the 2007 estimate of 6.1% for both unbranded loose tobacco and unbranded cigarettes.

Estimates of illicit trade in cigarettes are provided in a report conducted by Euromonitor (Euromonitor International, 2014). These estimates indicate annual increases in illicit trade by volume from 2009 to 2013. The report claims that a 9% increase in the illicit trade of cigarettes between 2012 and 2013 is due to the introduction of tobacco plain packaging. However, the report also states that the main driver behind the increase in illicit trade volume of cigarettes over the review period was the high rate of taxation payable on cigarette products. The report does not provide the method or data sources with respect to their estimate of illicit trade of cigarettes.

In Australia a number of peer-reviewed studies have attempted to measure changes in the illicit tobacco market over the time of introducing the TPP measure. Scollo et al. (2015) assessed the change in the availability of illicit tobacco in small mixed business retail outlets following the introduction of the tobacco plain packaging measure (Scollo, Zacher, Coomber, & Wakefield, 2015a). Small retail outlets (n = 303) were visited in June and September 2012 before the TPP measure as baseline months, and in December 2012 and February, April and July 2013, following the implementation of the measure. The study compared the cheapest pack offered by the retailer with the recommended retail price for the brand and pack size. In a sub-set of 179 stores, fieldworkers then asked the retailer about availability of unbranded chop-chop tobacco. The likelihood of either an offer to sell or information about where unbranded tobacco could be obtained did not differ across the three periods. Packs judged likely to be illicit were sold in response to requests for the cheapest available packs on less than 1% of occasions. Offers to sell unbranded tobacco were rare. The authors concluded no change in availability of illicit tobacco was observed following implementation of the tobacco plain packaging measure.

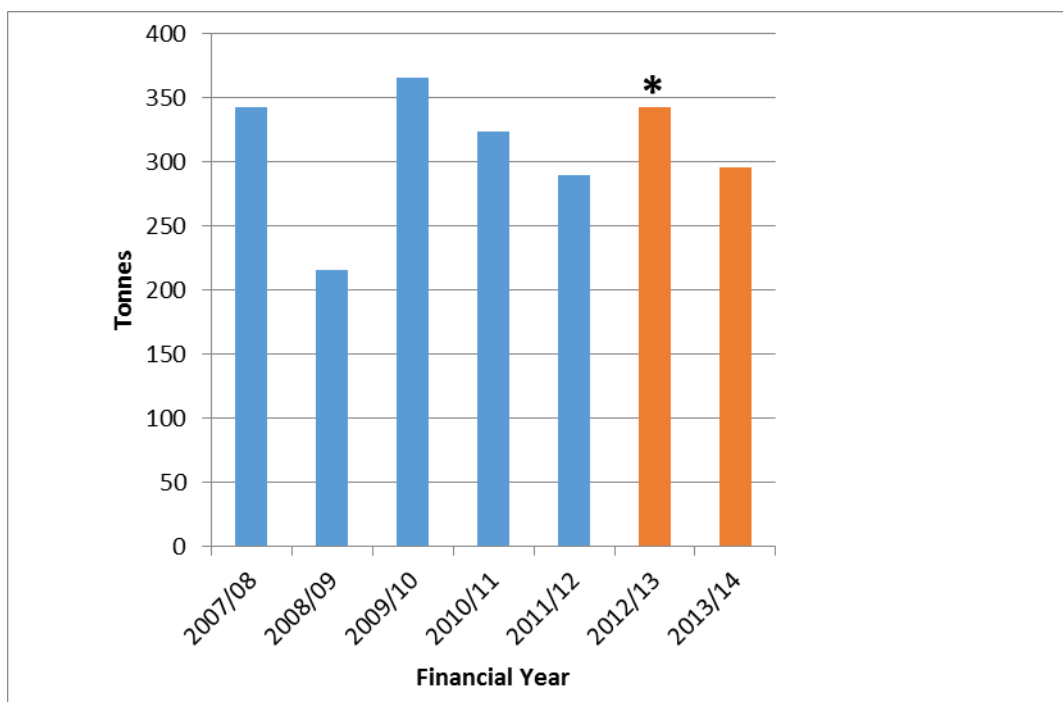
Based on repeated cross-sectional telephone surveys of smokers, the change in current use of unbranded illicit tobacco from 2011 (one year prior to tobacco plain packaging) and 2013 (one year post implementation of tobacco plain packaging) was measured (Scollo et al., 2014). The proportion reporting current use of unbranded illicit tobacco declined from 2.3% in 2011 (n = 754) to 1.9% in 2013 (n = 601). The observed reduction in unbranded illicit tobacco was not statistically significant. However the generalisability of this study may be limited given that the surveys were restricted to residents of Victoria and only included English speaking residents.

Based on a larger national study using repeated cross-sectional telephone surveys of smokers, the change in prevalence of smokers reporting any use of several categories of cigarettes which are highly likely to be illicit or contraband were assessed (Scollo et al., 2015a). Based on 8,679 adult smokers (weighted for telephony status, gender, age, education and state of residence), logistic regression was used to assess changes between pre-plain packaging (April

to September 2012), a transitioning phase (October and November 2012) and post tobacco plain packaging (December 2012 to March 2014). The study found that there were no significant increases in the use of: ‘cheap whites’²¹; international brands purchased for 20% or more below the recommended retail price; or packs purchased from informal sellers. There was no statistically significant change in the prevalence of unbranded illicit tobacco. As a 12.5% increase in tobacco excise customs duty was effective from the 1 December 2013, the authors attempted to control for any confounding by conducting a sensitivity test excluding the months after the tax increase (December 2013 through March 2014). The results of the sensitivity analysis suggested that the use of all three forms of illicit tobacco declined after the introduction of tobacco plain packaging, but that the use of contraband cigarettes and unbranded tobacco may have increased slightly after the 1 December 2013 increase in excise and customs duty.

Data from Australian Customs & Border Protection Service (2014) regarding tobacco detections via sea cargo has been compiled from annual reports (Figure 5) (Australian Customs and Border Protection Service, 2014). The total tonnes of tobacco estimated each year is calculated assuming a cigarette stick contains 0.8g of tobacco. Data is available for financial years (i.e. July 1st to June 30th) from 2007/08 until 2013/14. 2012/13 includes approximately five months of data when tobacco plain packaging was not in place and coincided with a period of transition.

Figure 5: Tobacco detections in sea cargo



* Tobacco plain packaging measure introduced during this financial year

Source: Australian Customs and Border Protection Service Annual Reports (Australian Customs and Border Protection Service, 2014; United Kingdom Department of Health, 2015)

²¹ Cigarettes that are manufactured legally in the country of origin, but are intended specifically for the illicit market and are sold without duty having been paid in the destination country

There were 343 tonnes of tobacco detected in 2012/13 (183 tonnes of loose tobacco plus 200 million cigarette sticks) and 296 tonnes detected in 2013/14 (178 tonnes of loose tobacco plus 147 million cigarette sticks). This compares with previous detections of: 343, 216, 366, 324 and 290 over the period of 2007/08 to 2011/12. The amounts detected in 2012/13 and 2013/14 are not inconsistent with the general variation that is seen from year to year.

However, changes in tobacco detections via sea cargo have not been validated as an appropriate measure of change in the size of the illicit tobacco market in Australia. It must be highlighted that a number of other important factors are likely to influence detections in sea cargo, most notably changes in smuggling methods, changes in detection activities and or efficacy of detection activities.

Box 6: Summary Impact on Illicit Market

Any change in illicit tobacco consumption in Australia is likely to be determined by a number of supply and demand factors, of which the price of legal tobacco products is one.

Based on the weight of evidence, it is considered most likely that the impact of the TPP measure on changes in the illicit tobacco market in Australia has been not been substantive, if there has been any impact at all.

There are a number of limitations in measuring significant changes within any illicit market. However, self-reported consumption estimates from both peer reviewed research and large scale national surveys conducted by the AIHW, in addition to Australian Customs & Border Protection Service data regarding the detection of illicit tobacco, do not support the claim that there has been a significant increase in illicit tobacco in Australia following the introduction of tobacco plain packaging.

Government Costs

The tobacco plain packaging initiative required government resources to implement, and oversee compliance and enforcement of the TPP measure. A total of eleven government departments and organisations provided feedback on the level of expenditure that was associated with the implementation and operation of the TPP measure. The following organisations provided information: Australian Customs and Border Protection Service, Department of Health, Australian Taxation Office, Australian Competition and Consumer Commission (ACCC), IP Australia, Queensland Department of Health, Western Australia Department of Health, Drug and Alcohol Services South Australia, Australian Capital Territory Health, New South Wales Ministry of Health, and the Cancer Institute NSW.

The Australian Customs and Border Protection Service introduced a legislative amendment which provided a temporary tobacco duty refund provision associated with the introduction of the tobacco plain packaging legislation. Under this arrangement, those who had paid duty on imported non-plain packaged products could surrender those products for a controlled destruction by Customs and receive a refund of any duty paid. The costs associated with this included planning, implementation, the establishment of a Tobacco Taskforce, administering and processing claims for refunds. The Australian Customs and Border Protection Service estimated the costs associated with all these tasks and are included in Table 6.

The Department of Health incurred costs for implementation, and compliance and enforcement activities under the TPP measure. The activities included developing a compliance and enforcement framework for the tobacco plain packaging legislation; development of communications materials; setting up a Memorandum of Understanding with

the National Measurement Institute (NMI) to undertake educational visits and compliance activities on behalf of the Department of Health; setting up a complaint handling process and an Enforcement Committee to make decisions on complaints and investigations.

The ACCC identified some costs associated with being involved in administering the tobacco health warning legislation in relation to tobacco products and crossover to the tobacco plain packaging legislation. Both the Australian Taxation Office and IP Australia incurred costs associated with training staff and advised that other dealings were in line with business as usual. The Queensland Department of Health, Western Australia Department of Health, Drug and Alcohol Services South Australia, Australian Capital Territory Health, New South Wales Ministry of Health, and Cancer Institute NSW, identified that whilst there were opportunity costs associated with the tobacco plain packaging legislation, they were non-substantive.

The total Government cost of the tobacco plain packaging legislation is estimated to be \$12.69 million over 10 years (Table 6) discounting future costs at 7% per annum. The cost estimates provided are based on an aggregation of data provided by Australian Customs and Border Protection Service, Department of Health (including costs under the Memorandum of Understanding with the NMI), Australian Taxation Office, IP Australia and the ACCC. The cost in year one are inflated relative to future years as this includes one-off implementation costs. The costs incurred since the implementation of the TPP measure are estimates as some data is subject to confidentiality and not-for-publication restrictions. The cost estimates over the future periods (years 4-10) are also uncertain as these are based on predicted future costs. Where estimates were provided with respect to full-time-equivalent staff, salary costs were inflated by 75% to account for non-wage labour on-costs and overheads. This inflation is consistent with the guidance note on the Regulatory Burden Measurement Framework from the OBPR.

Table 6: Government costs of tobacco plain packaging measure, \$ millions (discounted 7%)

Year	1	2	3	4	5	6	7	8	9	10
Government costs per annum	3.49	1.75	1.57	1.31	1.23	0.76	0.71	0.67	0.62	0.58
Total										12.69

Tax

A drop in the consumption of tobacco products will result in lower tobacco sales and thus the government is likely to lose some tax revenues due to the loss of excise and custom duties associated with those foregone sales. Some of this lost revenue is likely to be recovered through tax payable on non-tobacco products consumers buy with the money they would have otherwise spent on tobacco products (that is the government will collect some GST from this alternative spending). However, given the large size of tobacco excise and custom duties any taxes received on expenditure on other products are unlikely to completely equal the foregone revenue. There may also be a loss due to corporate tax revenues given that corporate profits for tobacco manufacturers are relatively high. These tax losses, however, are regarded as transfer payments and are not generally included as part of the analysis of a measure's costs and benefits. That is, there is no net effect on society. The tax loss to government can be conceived of as a saving to the consumers who have additional money to spend in the economy.

Box 7: Summary Impact on Government costs

A number of Government organisations undertook a variety of activities associated with tobacco plain packaging. The resources spent on these activities have an opportunity cost and should be reflected in the analysis of costs and benefits. Based on submissions from the Government agencies, the discounted cost of implementation, compliance and enforcement of the tobacco plain packaging measures over 10 years is estimated at \$12.69 million. This report does not consider the impact of the measure on tax to be substantive given the transfer of the benefit of any decrease in taxation revenue to consumers.

Conclusion

This analysis considered both the costs and benefits attributable to the TPP measure compared with business as usual.

The analysis identified a number of potential costs and benefits that may have been associated with the tobacco plain packaging measure. These included: transitional packaging costs, increase in retail transaction costs, ongoing packaging savings, increased profits on non-tobacco products, increased workforce productivity, reduced cleaning costs, reduced health care costs, increased government costs from additional monitoring and enforcement, health benefits, changes in consumer surplus, reduced profits on tobacco products, and increased amenity value.

For each of the above identified possible costs and benefits, the available evidence was reviewed to consider the attributable costs and benefits to the tobacco plain packaging measure relative to the comparator, business as usual. Where possible costs and benefits were identified but unable to be quantified or monetised they have been discussed in the report above and where possible illustrative examples have been explored (for example, in relation to health benefits and savings resulting from reduced packaging costs).

As noted above by way of illustrative example of the measure's potential health benefits, a half per cent reduction in smoking prevalence is equal to 30,318 life years. Distributed over OBPR recommended ten year time horizon, this would have an estimated monetary value of \$273 million. In addition to the potential health benefits from current smokers, TPP will have an ongoing impact on the uptake of smoking for each subsequent cohort of potential smokers (i.e. those currently aged 11). For example, a half per-cent reduction in those who are estimated to take up smoking in the future is equal to 70 persons each and every subsequent year. This would translate to an additional 160 life years each and every year after the introduction of the TPP.

Based on a regulatory burden measurement for TPP of \$73.87 million²², a 0.013 percentage point reduction in smoking prevalence attributable to the TPP would generate sufficient health benefits in a monetary value to exceed the estimated potential compliance costs of the TPP.

With respect to potential reduced profits and/or reduced value of tobacco brands, this analysis has considered the net impact of the tobacco plain packaging measure over the broader economy. Specifically, any reduced expenditure on tobacco products are likely to be redistributed into non-tobacco industries and any reduced value of tobacco product brands likely to be offset by increased value of non-tobacco product brands.

This analysis has also considered and included the potential disruption on tobacco retailers from the sale of tobacco products in plain packaging. The evidence indicates that Australian retailers have quickly adapted to any imposition. However, during this period of adaptation and through investment in strategies to mitigate any such imposition, retailers have incurred costs. This study has relied upon both published peer-review evidence as well as evidence provided during consultations to provide an estimate that is reflective of these activities.

In addition to the potential health benefits, tobacco plain packaging is also likely to produce ongoing cost savings associated with reduced packaging expenses. Based on a previously

²² This figure is subject to limitations described in pages 7 to 9 above.

published estimate of the reduced packaging costs (and adjusted to an Australian dollar estimate), an illustrative example showed these savings could be within the range of \$92 million and \$277 million over a ten-year period. Such savings, if achieved, would outweigh the estimated compliance costs of the measure.

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