

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

This paper was submitted to the Tobaccocontrol but declined for publication following peer review. The authors addressed the reviewers' comments and submitted the revised paper to BMJ Open where it was re-reviewed and accepted.

ARTICLE DETAILS

TITLE (PROVISIONAL)	A Comparative Assessment of the Price, Brands and Pack Characteristics of Illicitly Traded Cigarettes in Five Cities and Towns in South Africa
AUTHORS	Wherry, Anna; McCray, Cheyenne; Adedeji-Fajobi, Temidayo; Sibiyi, Xolani; Ucko, Peter; Lebina, Limakatso; Golub, Jonathan; Cohen, Joanna; Martinson, Neil

VERSION 1 - REVIEW

REVIEWER	Dorotheo, Edgardo Ulysses
REVIEW RETURNED	16-Mar-2013

GENERAL COMMENTS	<p>The distinction between industry-funded studies and this one is appreciated, but how do you explain that your results, while lower than the 40-50% reported by BAT-funded studies, are higher than the 20% market share claimed by BAT-SA?</p> <p>Also, the tobacco industry commonly uses litter surveys to estimate illicit cigarettes, often producing rather high estimates without providing its methodology for scientific scrutiny. Your recommendation of the litter survey methodology may inadvertently provide credibility to the industry's claims.</p> <p>Because estimates of illicit trade, when available, can vary widely, it would make more sense to recommend that several methodologies be used to triangulate the true prevalence, rather than recommending a single method and omitting the rest. In addition, the discussion would have benefited from a quick reference to methodologies that compared trade and consumption data, or are these unavailable?</p> <p>The discussion also lacked details related to the 3 study sites selected for their proximity to the national border. What are the implications of high/low estimates for each of these sites?</p> <p>Page 14, line 36: missing year that reference was accessed</p>
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REVIEWER	Joossens, Luk Foundation against Cancer
REVIEW RETURNED	17-Mar-2013

GENERAL COMMENTS	1)we wellcome the research and believe that it is important that such pilot studies are undertaken. However, we have serious reservations concerning the conclusions of the study and recommendation that the most reliable method of determining contraband in SA is the
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	<p>collection of discarded cigarette packs. Collection of discarded cigarette packs is a method which is often used in studies sponsored by the tobacco industry without providing details on the way the packs are collected. In this article, the authors collected 100 discarded cigarette packs in one area of the city and believe that this is a valid and recommendable method. It is not. It is only valid for that area and not for the rest of the city. In many cities around the world, contraband is high in some areas and low in other. I would recommend the authors to read to study of David Merriman in Chicago: Merriman D (2010). The Micro-Geography of Tax Avoidance: Evidence from Littered Cigarette Pack in Chicago. Am Econ J:Econ Policy, 2:61–84 doi:10.1257/pol.2.2.61 or a recent study by Kurti and al published in Tobacco Control of March 2013 in the South Bronx of NY.</p> <p>The conclusion (as well in many sections of the article) that the collection of discarded packs was the simplest approach to implement and most conservative estimate of contraband prevalence is not correct (you don't know it) and a dangerous statement as it would encourage industry sponsored research for the collection of discarded packs in specific areas of cities which will come up with high figures.</p> <p>What this study showed was the big difference of the percentage of discarded packs between the small cities(Nelspruit and Ficksburg). This should be part of the discussion section. Sometimes the industry do their surveys close to the border in the knowledge that it will result in high percentages.</p> <p>2) The article should clarify whether it is legal or not to import small amounts of cigarettes from neighboring countries. If it is legal to import cigarettes, it might be that some discarded packs are legal.</p> <p>3) tax stamps are easy to counterfeit. How did the researchers determine whether a tax stamp is counterfeit or not?</p> <p>4) 98% of the smokers in the survey are black males. What is the justification for not including in the survey?</p>
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- This manuscript received four reviews at Tobaccocontrol but the other two referees declined to make their comments public.

VERSION 1 – AUTHOR RESPONSE

Reviewer 2

Comments to the Author

1) The distinction between industry-funded studies and this one is appreciated, but how do you explain that your results, while lower than the 40-50% reported by BAT-funded studies, are higher than the 20% market share claimed by BAT-SA?

Recently, BAT-SA estimated 30% for the entire market of South Africa (http://www.batsa.co.za/group/sites/BAT_7N3ML8.nsf/vwPagesWebLive/DO7NAGWE?opendocument&SKN=1). We have updated our manuscript to include this new estimate. Furthermore, our study only focused on specific areas of the country providing a more concentrated sampling pool for contraband estimates. It must also be noted that different methodologies produced different

estimates. The dummy purchase consistently revealed higher observed prevalence than that observed for the collection of discarded cigarette boxes.

2) Also, the tobacco industry commonly uses litter surveys to estimate illicit cigarettes, often producing rather high estimates without providing its methodology for scientific scrutiny. Your recommendation of the litter survey methodology may inadvertently provide credibility to the industry's claims.

Because estimates of illicit trade, when available, can vary widely, it would make more sense to recommend that several methodologies be used to triangulate the true prevalence, rather than recommending a single method and omitting the rest. In addition, the discussion would have benefited from a quick reference to methodologies that compared trade and consumption data, or are these unavailable?

We now explicitly state that the methodology must explicitly be provided when conducting a litter survey. Triangulating would be a very valuable tool, however we believe that the smoker survey was more problematic than insightful. Therefore, we have recommended using the litter survey in conjunction with the dummy purchase in order to provide a dual methodology.

3) The discussion also lacked details related to the 3 study sites selected for their proximity to the national border. What are the implications of high/low estimates for each of these sites?

Proximity to border was not always an indicator for illicit trade; although the highest observed prevalence was indeed in Musina and Nelspruit, Ficksburg had the lowest observed prevalence. Many people around these bordering cities were day-time workers from Zimbabwe, who smoke and dispose their cigarettes in South Africa while they were working, which can imply that some of the discarded cigarettes were not due to illicit trade. We have included a sentence on this point.

Reviewer: 3

Comments to the Author

1) We welcome the research and believe that it is important that such pilot studies are undertaken. However, we have serious reservations concerning the conclusions of the study and recommendation that the most reliable method of determining contraband in SA is the collection of discarded cigarette packs. Collection of discarded cigarette packs is a method which is often used in studies sponsored by the tobacco industry without providing details on the way the packs are collected. In this article, the authors collected 100 discarded cigarette packs in one area of the city and believe that this is a valid and recommendable method. It is not. It is only valid for that area and not for the rest of the city. In many cities around the world, contraband is high in some areas and low in other. I would recommend the authors to read to study of David Merriman in Chicago: Merriman D (2010). The Micro-Geography of Tax Avoidance: Evidence from Littered Cigarette Pack in Chicago. Am Econ J:Econ Policy, 2:61–84 doi:10.1257/pol.2.2.61 or a recent study by Kurti and al published in Tobacco Control of March 2013 in the South Bronx of NY.

The conclusion (as well in many sections of the article) that the collection of discarded packs was the simplest approach to implement and most conservative estimate of contraband prevalence is not correct (you don't know it) and a dangerous statement as it would encourage industry sponsored research for the collection of discarded packs in specific areas of cities which will come up with high figures.

Thank you for your comment and recommended reading, we have included it in our references. We agree that the collection of cigarette packs in a specific area could potentially produce higher figures if the researcher is intentionally selecting areas where they know illicit discarded cigarettes packs to be high. However, in the 3rd and 4th paragraphs of our discussion section we make mention of the limitations of the sampling size; we will now clarify this aspect more so.

We also agree that the actual prevalence of contraband cigarettes in South Africa is more nuanced and dependent on socioeconomic factors and micro-economic factors. However, our studies purposes were to pilot methods of assessing contraband in select areas, not to determine contraband for the entire country of South Africa. From the 3 specific methods we implemented (all in the 5 concentrated areas), the discarded cigarette packs produced the most conservative estimates of our sampling.

2) What this study showed was the big difference of the percentage of discarded packs between the small cities (Nelspruit and Ficksburg). This should be part of the discussion section. Sometimes the industry do their surveys close to the border in the knowledge that it will result in high percentages.

We now include this consideration as part of the discussion.

3) The article should clarify whether it is legal or not to import small amounts of cigarettes from neighboring countries. If it is legal to import cigarettes, it might be that some discarded packs are legal.

According to <http://www.southafrica.info/travel/advice/redtape.htm#UXDMwrU3uSo>, individuals are allowed to carry up to 200 cigarettes per person into South Africa. We understand this as a limitation of our study, particularly concerning the collection of cigarette boxes in border towns. We have addressed this in our discussion.

4) tax stamps are easy to counterfeit. How did the researchers determine whether a tax stamp is counterfeit or not?

Our research team met with a South African expert on the legal packaging of cigarettes who also possessed many examples of cigarette boxes with fake excise stamps on them for us to review. We now mention this in the methods section.

5) 98% of the smokers in the survey are black males. What is the justification for not including in the survey?

The purpose of our project was not to determine the exact prevalence of contraband in South Africa. The pilot study's intention was to pilot three methods and determine their ability to provide useful information on contraband cigarettes in the area. Each component of the methodology represented an integral contributing factor to the cycle of illicit cigarette trade. The Dummy Cigarette Purchases represented a method that reflected *the source of supply*. The Cigarette Pack Collection was a method that allowed for the analysis of *the product packing*. The Smokers Survey which served as a method stemming from *the source of demand*, the user.

VERSION 2 – REVIEW

REVIEWER	Michal Stoklosa Economist, Economic and Health Policy Research, American Cancer Society
REVIEW RETURNED	25-Mar-2014

GENERAL COMMENTS	<p>The manuscript has undergone a major revision since its last submission to the Tobacco Control journal. The revision was definitely advantageous to the paper. The limitations of the study are now clearly stated and the paper uses consistent terminology around illicit cigarette trade. I just have two minor comments that authors might consider to add to their paper.</p> <p>1. In the strengths section, the authors mention that their three methods required little time and resources. I think that this is a very valuable finding of the study. If only there was a way of conducting a geographically representative study using one or more of the methods suggested in the paper, governments should consider conducting such independent studies as an alternative to the industry estimates. This issue might be worth discussing in the paper.</p> <p>2. Another valuable finding of the paper is the one regarding price differences between illicit and legal packs. However, the information on the price differences is only provided for the first method: pack purchase from the informal vendors. The authors might also consider providing information on the price difference between legal and illicit packs in the results of the third method: smokers survey.</p> <p>Other minor comments:</p> <p>1. In the abstract, please indicate when the study was conducted.</p> <p>2. p. 5 lines 8-9: you mention that “illicit trade in tobacco products comprises 30% of the total market share [16] with an estimated prevalence of illicit cigarettes in South Africa to be 40-50%”. How is this possible? I thought that the prevalence of illicit cigarettes is the same as their market share.</p> <p>3. p. 7, line 34: there is a dot missing in “cigarettes Contraband”</p> <p>4. In the methods section for the pack purchase from the informal vendors, the authors state that the cheapest price has been</p>
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	<p>collected (p.6), whereas Table 2 at p. 10 reports average prices. Are these prices average or the cheapest?</p> <p>5. p. 12: a word is missing in the: "almost all (98.5%) survey participants identified as male"</p> <p>6. References # 19 and 20 from the reference list never appear in the text.</p>
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VERSION 2 – AUTHOR RESPONSE

1. In the strengths section, the authors mention that their three methods required little time and resources. I think that this is a very valuable finding of the study. If only there was a way of conducting a geographically representative study using one or more of the methods suggested in the paper, governments should consider conducting such independent studies as an alternative to the industry estimates. This issue might be worth discussing in the paper.

We agree that it would be helpful to better highlight the timely and limited resource aspect of the methodologies. We have included the following sentence on page 13: "Despite these limitations, the three methods we report required little time and resources to conduct. If future research is successful at using one of these methods to conduct a geographically representative study, governments may also consider conducting such independent studies as a cost-effective and time sensitive alternative to industry estimates."

2. Another valuable finding of the paper is the one regarding price differences between illicit and legal packs. However, the information on the price differences is only provided for the first method: pack purchase from the informal vendors. The authors might also consider providing information on the price difference between legal and illicit packs in the results of the third method: smokers survey.

We were unable to incorporate the second recommendation to include information on price differentials between illicit and legal cigarettes from the smokers survey. The survey only asked participants to report their prices paid for packs of cigarettes and single cigarettes, not to differentiate between the price paid for illicit and legal cigarettes.

Other minor comments:

1. In the abstract, please indicate when the study was conducted.

We have included when the study was conducted in the abstract.

2. p. 5 lines 8-9: you mention that "illicit trade in tobacco products comprises 30% of the total market share [16] with an estimated prevalence of illicit cigarettes in South Africa to be 40-50%". How is this possible? I thought that the prevalence of illicit cigarettes is the same as their market share.

We agree that this is not possible. After reviewing the background section, we have changed the sentence to read the following: "Tobacco company funded research suggests that 19 million cigarettes are sold illegally every day, amounting to an estimated illicit cigarette prevalence of 40-50% in South Africa [16]."

3. p. 7, line 34: there is a dot missing in "cigarettes Contraband"

We have added the dot missing between “cigarettes Contraband.”

4. In the methods section for the pack purchase from the informal vendors, the authors state that the cheapest price has been collected (p.6), whereas Table 2 at p. 10 reports average prices. Are these prices average or the cheapest?

We have added clarification to data analysis and Table 2 to read the average of cheapest prices reported.

5. p. 12: a word is missing in the: “almost all (98.5%) survey participants identified as male”

We could not find the word missing in this sentence and not have made any change.

6. References # 19 and 20 from the reference list never appear in the text.

We have eliminated references #19 and 20.