



Institute
and Faculty
of Actuaries

E-cigarettes – no smoke without fire

A presentation on the work of the IFoA e-cigarettes working party

Agenda

- A short quiz!
- Current UK e-cigarette landscape
- What's in an e-cigarette
- Modelling
- Underwriting
- Claims
- Survey
- Product design
- Questions

Disclaimer

The views expressed in this presentation are those of the presenter(s) and not necessarily those of the IFoA or their employers.

A short quiz to get you thinking

- What does cotinine test for ?
- Which countries ban e-cigarette sales ?
- What is the limit in nicotine strength allowed to be sold in UK e-cigarettes ?
- How much would a 20 a day smoker save in a year if they quit smoking ?
- How many years since quitting is CHD risk that of a never-smoker ?

A short quiz to get you thinking

- What does cotinine test for ?

Nicotine

- Which countries ban e-cigarette sales

Quite a few !

- What is the limit in nicotine strength allowed to be sold in

20mg / l

- How much would a 20 a day smoker save in a year if they quit smoking

£3,100 per annum

- How many years since quitting is CHD risk that of a never-smoker ? 15

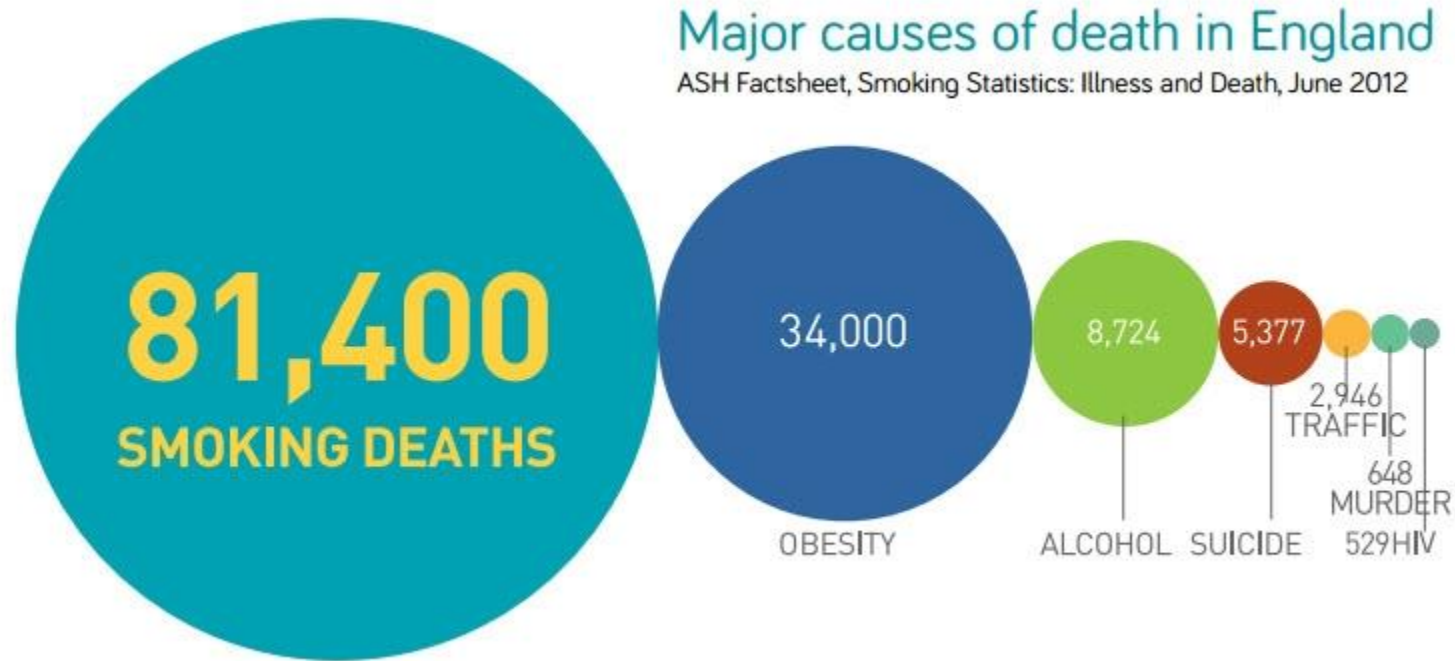


Background to the group

- Set up by the Institute and Faculty of Actuaries to look at the impact of e-cigarettes on the life industry
- Our Terms of Reference. The impact of e-cigarettes on the life insurance industry. We will consider pricing, underwriting, claims issues
- For all core life products
- The group has a mixture of actuaries and claims & underwriting folks
- Aim is to share what we find with the wider insurance community through presentations, papers etc.
- We have very much aimed our work at traditional e-cigarettes

Current smoking landscape in UK

- Deaths from tobacco are a huge proportion of deaths in all countries
- In England,



Changing the smoking landscape...



A few stats!

Currently in UK,

- **3.6m** current e-cig users
 - **54%** ex-smokers
 - **40%** dual users
 - **6%** never smoked

Source : <https://ash.org.uk/wp-content/uploads/2019/09/Use-of-e-cigarettes-among-adults-2019.pdf>

Setting the scene



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E-cigarettes contain chemicals that some 'as harmful as normal tobacco'

- Findings from the National Consumers' Institute said it tested rechargeable and disposable models for carcinogenic and toxic
- Researchers 'detected a significant quantity of carcinogenic n the vapour of these cigarettes which have thus far gone undet
- Report also criticised certain models for lacking child-proof s because nicotine levels contained could be lethal to children

By IAN SPARKS
PUBLISHED: 13:33, 26 August 2013 | UPDATED: 08:48, 28 August 2013

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Public Health England

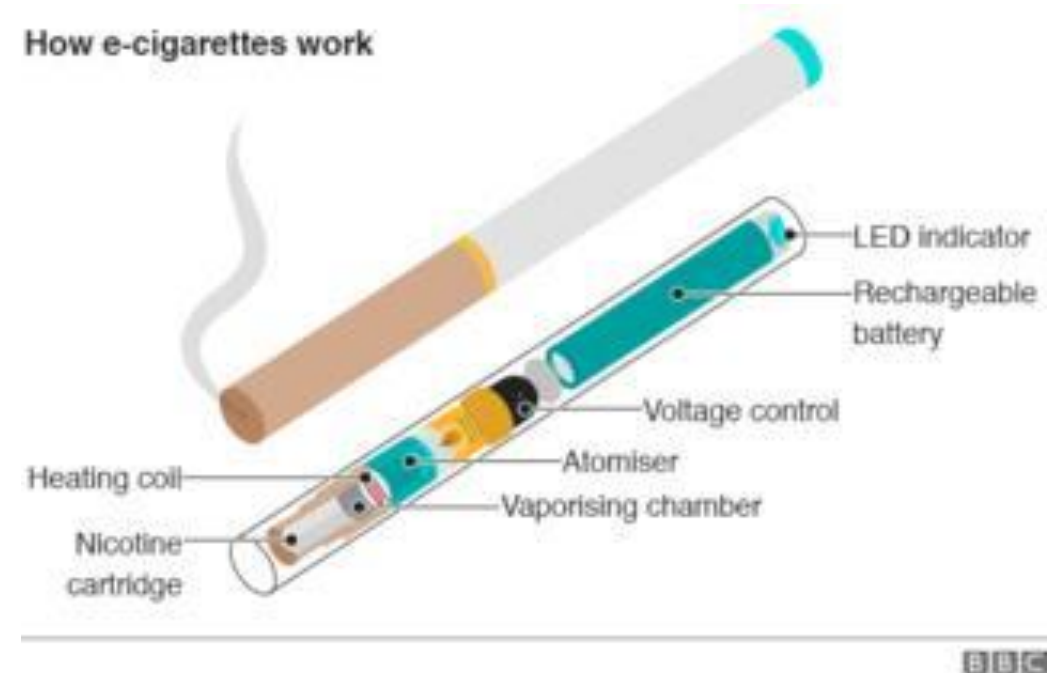
E-cigarettes around 95% less harmful than tobacco

Setting the scene

- In 2019 there has been an increase in negative news regarding e-cigarettes circulating in the media.
- Within the USA recent reports have linked a number of deaths to the use of e-cigarettes.
- While this is a concern it is becoming more apparent that these deaths are linked to the consumption of unregulated liquids containing Tetrahydrocannabinol (THC), the psychoactive element found in cannabis.
- THC is banned in the UK & hence we believe there is not a key concern for the UK

What's in an e-cigarette

- Humectants (dissolving solutions)
- Nicotine
- Flavourings



What's in an e-cigarette

Humectants

- The humectant is often vegetable glycerine or propylene glycol
- Both of which are used in the food industry
- But do we really know if they are safe when heated to a vapour?

Nicotine

- Nicotine has some health-related concerns
- But is relatively far down the list of bad components in a cigarette
- They do create an addiction – but this is a necessary feature in helping people quit smoking

What's in an e-cigarette

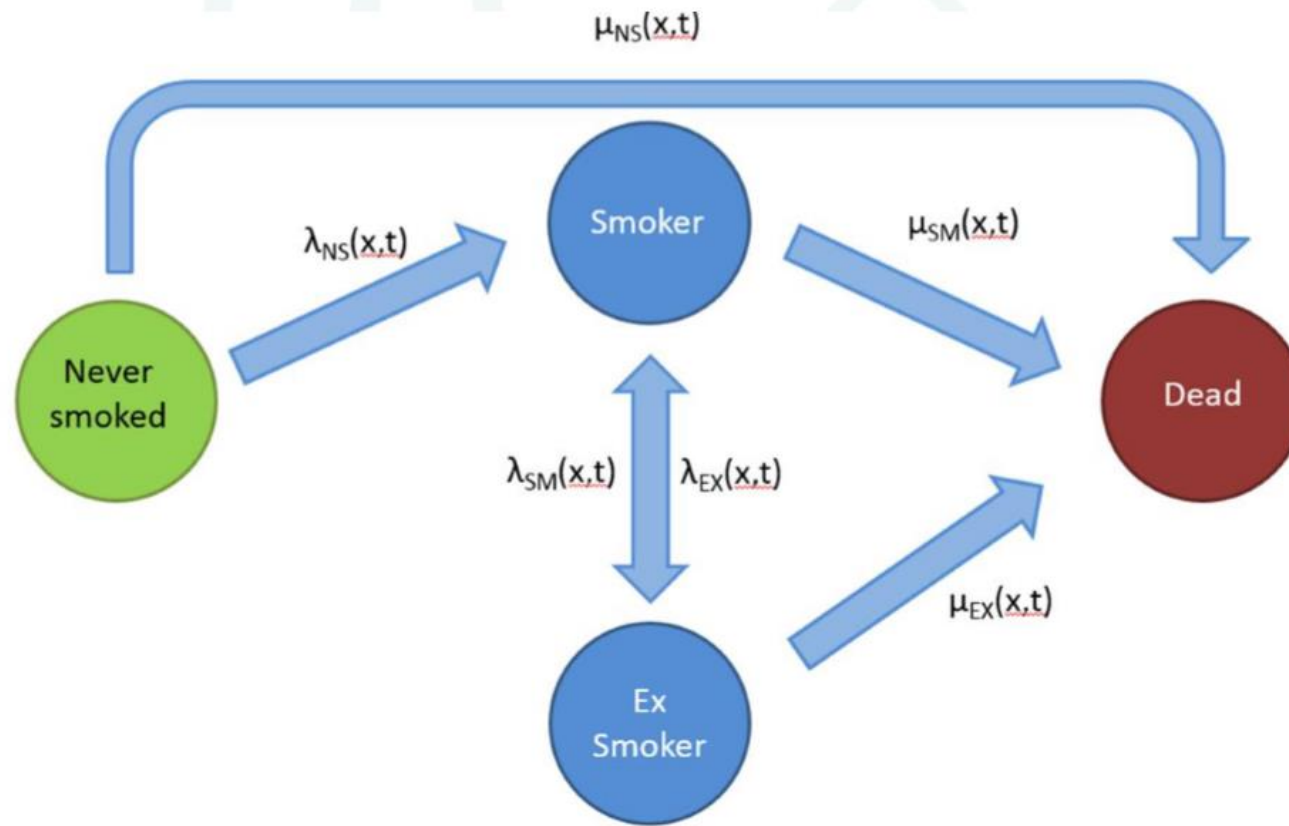
Flavourings

- Flavourings are a concern
- Studies have shown that many contain diacetyl (which contributes to “popcorn lung”)
- And other at-risk chemicals

But at far lower levels than in traditional cigarettes

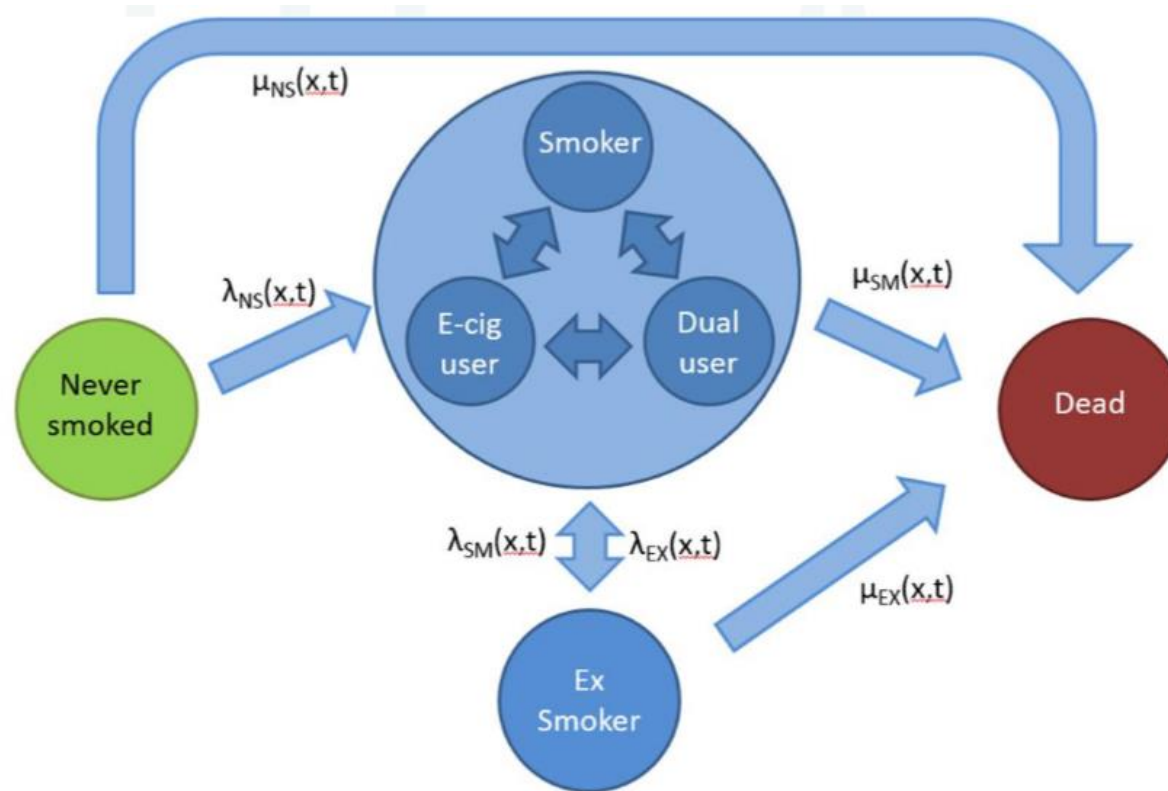
Modelling

A traditional multi-state model for modelling smoking transitions might look like this:



Modelling

- But when we introduce e-cigarettes, the model gets significantly more complex:



Modelling

- We must understand many different factors to truly understand the impact of e-cigarettes
- The key ones are
 - **relative risk of e-cigarette smoking** and
 - **impact on quit rates**

Modelling

Relative risk of e-cigarette use

- The most important parameter that we are trying to derive !
- Need to separate this by
 - Dual use v ex-smoker
 - By duration since use / since quitting tobacco
 - By Age / Sex / Socio-economic etc.
- Long term research into e-cigarette risk does not yet exist
- In fact some studies claim to be “long term” but are actually 6 -12 months

Modelling

Relative risk of e-cigarette use

- And none look at mortality (yet)
- But there are alternatives
 - Chemical composition analysis – ie looking at the level of key risk chemicals in e-cigarettes vs traditional tobacco. Most chemicals are in e-cigarettes at a far lower level than traditional tobacco. But some chemicals (e.g. some flavourings) are not in tobacco
 - Genetic mutation analysis. We can detect minute changes in genetic makeup far more quickly than it would take to do a formal mortality study. Various studies have looked at output from tobacco & e-cigarettes and have washed them into solutions & then exposed these to bacteria and measured the impact on gene mutation
- These show promising results but are not “proof”

Modelling

Impact on quit rates

- Data on the impact of e-cigarettes on smoking cessation is limited.
- One study from 2019 looked at 886 NHS stop smoking services users and randomly allocated them to either traditional NRT (e.g. patches) or e-cigarettes. After one year of follow up, the proportion of those who were assigned e-cigarettes who were still non-smokers was 18% compared to 9.9% of those assigned other NRT products.
- This implies that e-cigarettes are twice as effective as traditional NRT in helping people quit. But a more conservative view would say that even then 82% of people had relapsed back to smoking.

Modelling – The Public Health England view...

- ‘95% better than traditional cigarettes’
 - Size of in-force term block in the UK of £4,400 million
 - Assuming that:
 - Non-smokers have 100% mortality
 - Smokers have relative mortality as per TSM00 / TNM00
 - E-cigarettes lead to a 2% increase in smoking cessation
 - E-cigarettes users are all recent quitters, their smoker mortality reduces linearly down to non-smoker mortality over a period of 15 years
- **Impact on present value of claims: £863 million**



Underwriting

If e-cigarettes users are ultimately concluded to be significantly less risky than cigarette smokers, and that people who use e-cigarettes will persevere, then we need to be able to properly underwrite them which involves both:

- Suitable questions
- A test that can accurately determine type of cigarette used

Application questions would need to be clear and unambiguous.

- E-cigarettes would ideally need their own question.
- Need to capture people who dual smoke
- What is meant by 'quitting'

Underwriting

Distinguishing between cigarettes and e-cigarette usage

Cotinine is a chemical produced by the body after exposure to nicotine. Found in the urine or blood after using any of the following:

- Cigarettes, patches, gum or e-cigarettes

Cotinine testing is used to confirm smoker status at underwriting stage

Exhaled carbon monoxide is present in tobacco smoke but not in vapour, Cotinine and carbon monoxide testing could be the test of the future:

- -ve cotinine and -ve CO = non-smoker, non-vaper
- +ve cotinine and +ve CO = smoker, possible vaper
- +ve cotinine and -ve CO = possible vaper

Claims

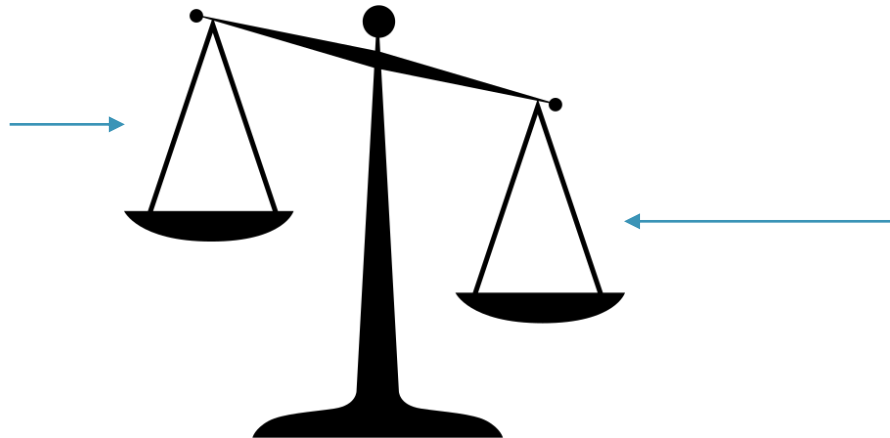
- 4 of the 5 top causes of death in the UK are undeniably linked to smoking:
 - ~~Dementia and Alzheimer disease~~
 - Ischaemic heart diseases.
 - Cerebrovascular diseases.
 - Chronic lower respiratory diseases.
 - Lung cancer.
- Over £5.3 billion was paid out in claims across all product types in 2018 (ABI publication 2019)
- E-cigarettes could lead to improvements in claims experience in years to come

Claims

2 mains areas of concern:

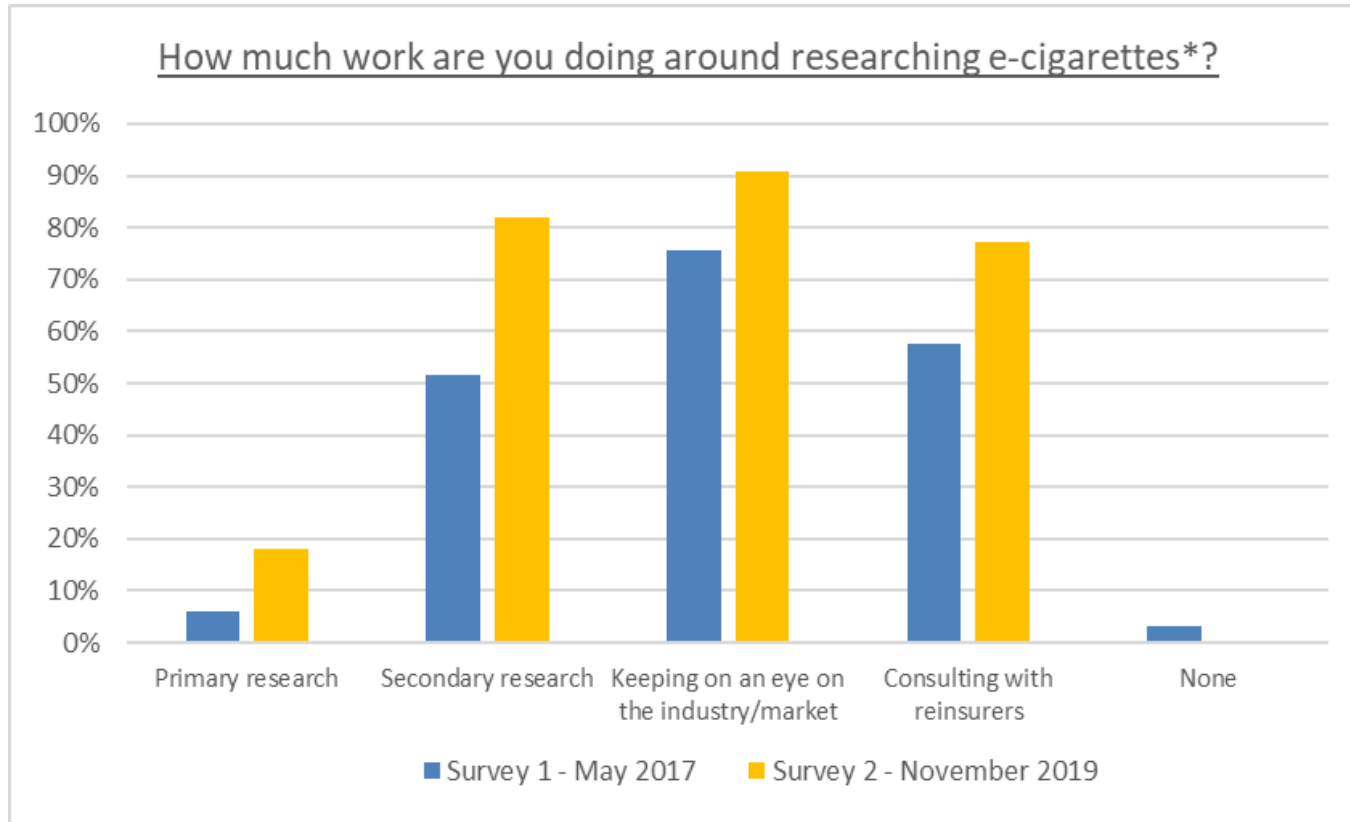
- Complex misrepresentation investigations
- Relapse rates to cigarettes

E-cigarettes leading to
reduction in smoking
related claims



- Unidentified misrepresentation
- Increased relapse rates
- “Gateway” risk

Industry Survey



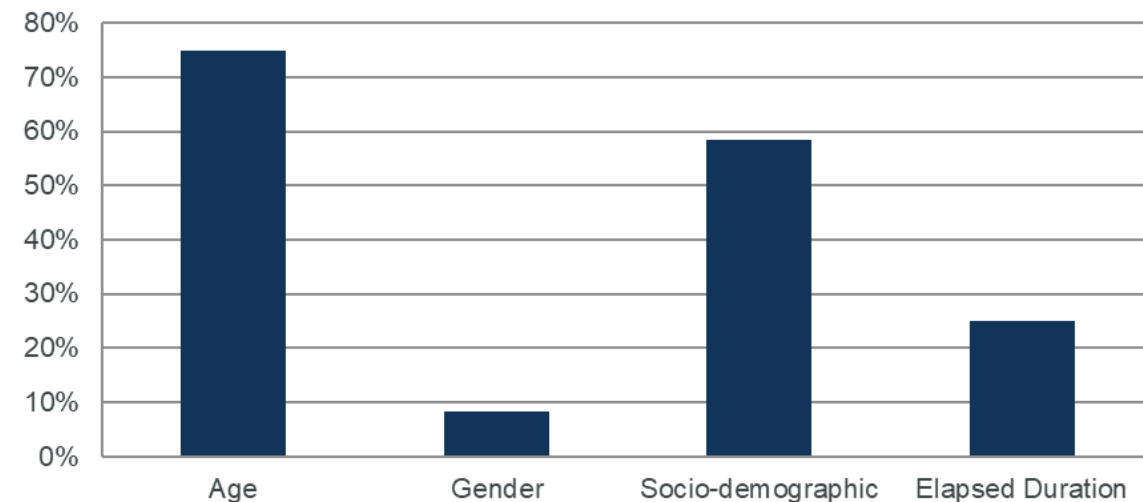
**respondents may select multiple answers*

- Uptake in research being conducted
- Industry-wide change expected in attitude within the next 3 years
- Further published research and increased prevalence of e-cigarette smokers are considered the biggest drivers of this expected change

Industry Survey

- Gateway risk?
- Lapse and re-entry risk if “vaping” rates are offered
- Less relevant for annuity book
- Low socio-economic are more likely than higher socio-economic groups to be ex-smokers or dual users?
- Younger people more likely to be users, older people less likely to make the switch

Factors that influence the level of impact you believe e-cigarettes have on your business:



Industry Survey

- Insurers apply smoker rates for e-cigarette users, despite ‘increasing pressure to treat differently to smokers’
- Changes from non-smoker treatment to smoker treatment is based on *“Reinsurance changes and our own CMO view”*
- Reliance upon technology to test for e-cigarette vs traditional cigarettes usage
- Direction of expected industry change is widely contested:

‘More caution due to lung injuries’

‘[The approach to e-cigarettes] will harden’

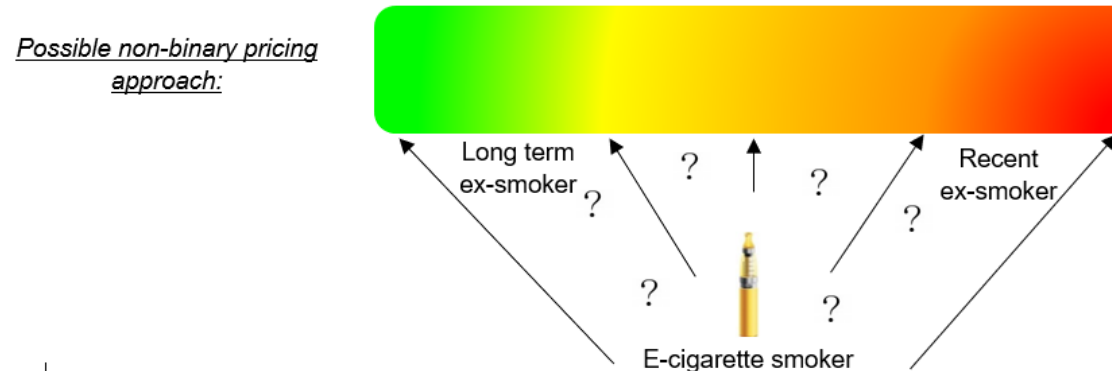
‘Once one mainstream insurer moves, expect there to be a market shift’

‘...shift towards “vaping” rates to be more widespread once more long-term data available’

‘More negative view of [e-cigarettes] as smoking cessation tool. Gateway for teenagers to get addicted.’

Product design

- Current products are essentially binary rated – non-smokers or smokers
- There is some movement towards more of a scale – with heavy smokers, light smokers, recent ex-smokers, longer term ex-smokers and never smoked.
- But these are still not the norm
- Given uncertainty over e-cigarette risk, where would they slot into the scale?



- Is the answer a contract that has some reviewability ?

Product design

- Rate reviewability seems to have fallen out of favour – but would a contract with reviewability of smoking status work?
- i.e. rate starts at smoker rate (assuming a current or very recent ex-smoker) but then can reduce if the policyholder is certified as having quit (& stayed off tobacco)
- This does rely though on effective (& cheap) testing of smoking status

Next Steps

- Evidence is slowly emerging on e-cigarette safety and their effectiveness in helping people cease smoking completely.
- But we are still some way from a clear, unambiguous view.
- We believe that insurance providers and the IFoA (through CMI) could examine the feasibility of collecting mortality data
- This data could then be considered at a fairly granular level beyond smoker/non-smoker.
- Such a study would take time, firstly for the mortality data to emerge, and then to collect and collate it.

Questions

