

## Is 'hardcore smoker' a useful term in tobacco control?

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*The term 'hardcore' smoker is being used to describe people who are unwilling/unable to quit smoking. It conflates two largely independent constructs (motivation to quit and cigarette addiction) and assumes a degree of stability that is not present. Motivation to quit and ability to quit are extremely important smoker characteristics that merit investigation and use as separate constructs.*

There has been interest in recent years in a phenomenon that has been termed the 'hardcore' or 'hardened' smoker<sup>1-6</sup>. Studies have been published estimating the prevalence of such smokers in specific populations, and whether this proportion has changed over time. The hard-core smoker has been conceptualised as a 'daily, long-term smoker who is unable or unwilling to quit and who is likely to remain so even when possessing extensive knowledge about the hazards of smoking and when confronting substantial social disapprobation of smoking'<sup>7</sup>. The notion that, as smoking prevalence declines in a population, the remaining smokers are increasingly resistant to change, possesses intuitive attraction. However, operational definition and measurement have proved difficult.

The term has not been consistently defined but mostly it has been used to refer to smokers who have low motivation to quit and/or high levels of cigarette addiction<sup>7-8</sup>. Motivation to quit has been assessed variously by self-reported level of desire to quit or intention to quit, or having tried to quit at some time in the past. Cigarette addiction has mostly been assessed by cigarette consumption, but also by failure of attempts to quit or questionnaire measures of cigarette addiction such as the Fagerstrom Test for Cigarette Dependence (FTCD). The term has become associated with the 'hardening hypothesis', which is that as smoking prevalence falls, it becomes progressively more difficult to reduce prevalence further because the remaining smokers are less willing or able to quit as more motivated and less dependent smokers become ex-smokers<sup>7</sup>.

There are epistemological problems with the term as it is being used. One of these is that it conflates motivation to quit and cigarette addiction. The evidence shows that these characteristics are largely uncorrelated and are influenced by very different factors<sup>9</sup>. Thus, motivation to quit is positively related to concerns about the health consequences of smoking, the cost of smoking, and social pressures to quit<sup>9</sup>. It is higher in younger than older smokers, and in countries such as the UK it is largely unrelated to socioeconomic status<sup>9</sup>. Ability to quit (low cigarette addiction), on the other hand, is related to lower nicotine intake, is lower in younger than older smokers and in most countries is lower in those with lower socioeconomic status<sup>9</sup>. One could see a case for a term that encompassed smokers who were both highly dependent and had a low motivation to quit<sup>10</sup> but if the aetiology and consequences of the two component constructs are different it is difficult to see what the advantage would be.

Operationalising the construct of hardcore smoking has been a major challenge, with researchers turning to whatever indicators happen to be available in the survey data they have to hand, leading to a lack of consistency across studies. Cigarette consumption, the most widely available indicator of heaviness of smoking, has been pressed into service as an indicator of nicotine addiction, with many studies employing a cut-point of 15 cigarettes per day for hardcore smoking<sup>11</sup>. However, cigarette consumption is a poor indicator of nicotine dependence. Average cigarette consumption per day in the USA has declined by some 40% over the past twenty years, but without significant change in smokers' nicotine intake<sup>12</sup>. Since female smokers consistently smoke fewer cigarettes per day than do male smokers, use of a single cutpoint for both genders introduces bias.

Comparing estimates of hardcore smoking cross-nationally is particularly problematic, as although surveys will yield apparently comparable figures for the addiction and motivational elements of hardcore smoking, in the absence of reliable measurement of the current and historical tobacco control environment in different countries, these figures are uninterpretable. High cigarette consumption and low motivation to quit can arise just as much from an absence of awareness of smoking's impact as from entrenched attitudes. These difficulties also arise in making comparisons between groups within a country, for example between states in the USA<sup>13</sup>.

A further problem with the hardcore construct is that it assumes a degree of stability that is not necessarily present. While the FTCD has shown good re-test reliability<sup>14</sup>, it typically accounts for no more than 10% of the variance in ability to quit<sup>9</sup> and number of past quit attempts are at best a weak predictor of the success of future ones<sup>9</sup>. Studies of the test-retest reliability of measures of motivation to quit typically yield  $R^2$  of around 10%, and while they are predictive of future quit attempts the strength of association is not so great as to define a category of smoker in a way that is almost akin to a personality characteristic<sup>9</sup>.

Besides its epistemological status, the term 'hardcore' is misleading in its derivation from the everyday meaning of the term. The Collins dictionary defines 'hardcore' as 'committed' and 'extreme', yet these attributes are not typically assessed and so the natural inference from the term is unwarranted.

Aside from being scientifically problematic, the term 'hardcore' can lead to research that is at best meaningless and at worst misleading. Demonstrating an increase or decrease, or lack thereof, in the prevalence of this characteristic in a population cannot be interpreted because it may reflect a change in motivation or dependence, or changes in one opposing changes in the other leading to no change overall. Thus, research into 'hardening' produces results that can be interpreted in conflicting ways. If one is interested to establish whether smokers are currently less motivated to quit than previously one should measure that variable, and if one wishes to know whether smokers have greater difficulty quitting, then success rates or cigarette addiction would be appropriate measures to use. In both cases, it should be recognised that these characteristics have moderate stability and are likely to be mutable.

Equally importantly, because the term 'hardcore' is pejorative, its use arguably helps to sustain the stigmatisation of smokers that underpins a failure in most countries to put in the level of resources that are required to support smokers to stop<sup>15</sup>: resources that would pay dividends in economic and health terms<sup>16</sup>, and which would be provided for a public health problem that was not seen as being to some degree a moral failing on the part of the people affected.

There is no doubt that motivation to quit and ability to quit are key targets for any tobacco control strategy and clinical programme and are extremely important. There are also be important issues in how far these variables have changed over time in different countries. However, conflating them into a single construct is scientifically unjustified and best avoided.

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