Tar, nicotine, and carbon monoxide yields of some Nigerian cigarettes

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SUMMARY Fourteen cigarette brands manufactured in Nigeria in 1981 were analysed to determine the tar, nicotine, and carbon monoxide yields. Five of the brands belonged to the high and middle to high tar category (>22 mg/cigarette) and nine to the middle tar (17-22 mg/cigarette) category. None of the cigarettes was in the low to middle and low tar (<17 mg/cigarette) category. The nicotine and carbon monoxide yields were similar to those of European cigarettes. Tobacco companies need to manufacture low tar cigarettes in the third world as is the practice in the economically developed parts of the world.

Over the past three decades researchers have drawn attention to the various health problems caused by cigarette smoking. Overwhelming evidences incriminated smoking to varying extents in the pathogenesis of chronic obstructive bronchitis and coronary heart disease, as well as carcinoma of the bronchus, larynx, oesophagus, and bladder.¹⁻³ Attention has also been focused on the constituents of cigarettes smoke implicated in the pathogenesis of these different diseases. The well recognised are tar, nicotine, and carbon monoxide, while others of lesser importance include nitrogen oxides, cyanide, and acrolein.⁴ Tar and nicotine are the major constituents of cigarette smoke implicated as causative factors for coronary heart disease and carcinoma of the bronchus.⁵⁻⁸

In recognition of these facts various governments have entered agreements with tobacco companies to lower the tar and nicotine yields of their products. Smoking was introduced to Africa sometime in the fourteenth century and since then the habit has been on the increase.⁹ Earlier beliefs that the diseases related to smoking were not found in the African have changed with the findings from recent studies from parts of Africa.¹⁰⁻¹² Not only are these diseases present, but in some cases the incidence is increasing.¹³ There is also a suspicion that the tobacco companies because of the anti-tobacco lobby in Europe and America are diverting their attention to the third world, where the promotion of cigarette smoking is unrestricted.

There are no data on the tar, nicotine, and carbon

monoxide yields of cigarette manufactured in Nigeria and most African countries. The present study reports the analysis of smoke constituents of cigarettes available in Nigeria.

Material and methods

Ten packets of each of the 14 commonly available cigarette brands in Nigeria were purchased from different shopping centres in the town. All the cigarettes had been recently manufactured. The cigarettes were smoked in a Filtrona smoking machine and later analysed for tar, nicotine, and carbon monoxide yields using the method agreed by the laboratory of the government chemist and the tobacco companies.^{17 15} The tar yield was classified as:

High and (middle to high)—Values greater than 22 mg/cigarette.

Middle—Value 17-22 mg/cigarette.

(Low to middle) and low—Less than 17 mg/cigarette.

The costs of the different cigarette brands as sold in the local shops were noted. A structured questionnaire was administered to 1000 people specifically asking which of the cigarette brands they smoked and their cash earning power. The subjects were randomly selected.

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The socioeconomic groups were classified as:

High income—

Annual income was about ₦ 10 000 and above.

Middle income—

Annual income ₦ 3 000—₦ 10 000,

and

Low income— Annual income below ₦ 3 000.

Results

Table 1 shows the tar, nicotine, and carbon monoxide yields of the different cigarette brands analysed. Also included in this table is the percentage of the smokers interviewed smoking each brand of cigarette.

Table 1 Tar, nicotine, and carbon monoxide yields of some Nigerian cigarettes

Cigarette brands	Tar (mg)	Nicotine (mg)	Carbon monoxide (mg)	% of people smoking each brand
A Benson and Hedges luxury menthol	19	1.5	17.1	31.2
B Benson and Hedges special filter	20	1.6	15.6	
C State Express 555 filter king	20	1.7	15.1	2.5
D State Express 555 International	21	1.9	15.7	
E Target	17	1.1	15.8	3.0
F Varsity Menthol	22	1.3	17.9	0.6
G Sportsman king size	22	1.5	16.6	0.6
H Embassy	24	1.5	18.8	0.3
I John Player Gold Leaf	27	1.7	20.0	23.9
J 3 Ring	19	1.2	16.3	0.3
K Sweet Menthol filter	20	1.2	17.3	32.8
L Sweet Menthol king size filter	21	1.6	16.8	
M Mars filter	20	1.6	17.0	0.6
N Bicycle	27	1.7	20.0	2.2

2.0% belong to other cigarette brands not analysed

None of the cigarettes analysed was in the low tar category (table 2), five were in the high to middle and high group, and the remaining nine were in the middle tar category. Four brands in the high tar category were smoked by those in the middle socioeconomic group (table 3). The five high tar cigarette brands when pooled together were consumed by 27.6% of the people interviewed.

Table 2 Tar yield analysis of Nigerian cigarettes

	Tar (mg/cigarette)	No of cigarette brands
High and middle to high	> 22 mg	5
Middle	17–22 mg	9
Low to middle and low	< 17 mg	—

Table 3 Socioeconomic groups and most of each brand of cigarette related to the tar yield

Income grouping	Cigarette brands	Average cost of cigarette per packet of 20
High income	A, B, C, D	₦1.00
Middle income	E, F, G, H, I	55 kobo
Low income	J, K, L, M, N	35 kobo

None of the cigarettes belong to the low nicotine (<1 mg) category, although in four brands the levels were reasonably low (1.1 – 1.3 mg). The carbon monoxide levels are within the range of European and American cigarettes.

Discussion

Both governments and various antismoking organisations have made concerted efforts to persuade tobacco companies to produce low tar and low nicotine cigarettes. Such measures have led to reductions of 49%, 31%, and 11% in the tar, nicotine, and carbon monoxide yields respectively of cigarettes manufactured between 1934 and 1979 in Great Britain/United Kingdom.¹⁶

The only available data on the yields from cigarettes manufactured in Africa showed a disparity in tar yields between similar brands of cigarettes sold in Nairobi, Kenya, and the United Kingdom as shown by the findings that the State Express 555 sold in Kenya contained 31 mg tar and 2 mg nicotine but the same brand in the United Kingdom had 18 mg tar and 0.9 mg nicotine.¹⁷

Our study showed that five brands belonged to the high tar category and would have attracted tax surcharge if sold in the UK.¹⁸ It is remarkable that none of the cigarettes belonged to the low tar category, which is the trend among tobacco companies in Europe and America. It is also interesting that the cigarettes consumed by those in low and middle income groups belong predominantly to the high tar category and are relatively cheap. The implications of this are that although these people may smoke fewer cigarettes, in terms of total tar consumption they may be at the same risk of developing lung cancer as someone who smokes more low tar cigarettes. It is difficult for any government to ban smoking because of economic considerations and the only alternative would be production of safer cigarettes.

Lowering the tar and nicotine yields of cigarettes has been reported to cause some decrease in the incidence of some smoking related diseases.^{19–22} In view of the above observations tobacco companies need to conform to international standards in terms of yields from cigarettes sold in Africa. The various

governments must enact legislation to regulate cigarette promotions and for the cigarette packets to carry health warnings as well as imprints of tar, nicotine, and carbon monoxide yields as practised in Europe and America.

Unfortunately a recent attempt in Nigeria to enact such legislation was rejected because of lack of data. Perhaps with this information the issue may be more favourably considered in future. If action is not taken now we may be supplanting the various infective disorders related to poverty with tobacco related diseases, a problem that has been referred to as "the coming epidemic."²²

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