visits as the main advantage of the 12-week schedule. Participants were followed up for only 1 year, which—together with the significant increase in N-terminal telopeptide concentration in the 12-week group—raises concerns about the long-term skeletal consequences of reducing the dosing schedule of zoledronic acid.

The results of the ZOOM trial are interesting and could offer a rationale for switching to a 12-weekly schedule after 1 year of monthly treatment for some patients with poor tolerance to 4-weekly zoledronic acid. However, these patients are a minority. We think that before changing the American Society of Clinical Oncology recommendations for the remaining majority of patients, investigators need to show that 12-weekly (or even less frequent) administration of bone-modifying drugs after 2 years of conventional treatment is no worse for the patients than current practice.

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1 Novartis. Prescription information for Zometa (zoledronic acid) Injection. http://www.pharma.us.novartis.com/cs/www.pharma.us.novartis.com/product/pi/pdf/Zometa.pdf (accessed April 30, 2013).
2 Amgen. Prescription information for Xgeva (denosumab) http://pi.amgen.com/united_states/xgeva/xgeva_pi.pdf (accessed April 30, 2013).
3 Rosen LS, Gordon D, Kaminski M, et al. Zoledronic acid versus pamidronate in the treatment of skeletal metastases in patients with breast cancer or osteolytic lesions of multiple myeloma: a phase III, double-blind, comparative trial. *Cancer J* 2001; **7:** 377–87.
4 Rosen LS, Gordon D, Kaminski M, et al. Long-term efficacy and safety of zoledronic acid compared with pamidronate disodium in the treatment of skeletal complications in patients with advanced multiple myeloma or breast carcinoma: a randomized, double-blind, multicenter, comparative trial. *Cancer* 2003; **98:** 1735–44.
5 van Poznak CH, Temin S, Yee GC, et al. American Society of Clinical Oncology executive summary of the clinical practice guideline update on the role of bone-modifying agents in metastatic breast cancer. *J Clin Oncol* 2011; **29:** 1221–27.
6 Lee SJ, Park S, Ahn HY, et al. Implications of bone-only metastases in breast cancer: favorable preference with excellent outcomes of hormone receptor positive breast cancer. *Cancer Res Treat* 2011; **43:** 89–95.
7 Stopeck AT, Lipton A, Martín M, et al. Denosumab in patients with breast cancer and bone metastases previously treated with zoledronic acid or denosumab: results from the 2-year open-label extension treatment phase of a pivotal phase 3 study. *Cancer Res* 2011; **71** (suppl 3)**:** abst P3-16-07.
8 Stopeck A, Lipton A, Body JJ, et al. Denosumab compared with zoledronic acid for the treatment of bone metastases in patients with advanced breast cancer: a randomized, double-blind study. *J Clin Oncol* 2010; **28:** 5132–39.
9 van den Wyngaert T, Delforge M, Doyen C, et al. Prospective study of treatment pattern, effectiveness, and safety of zoledronic acid (ZOL) therapy beyond 24 months: subgroup analysis of patients (pts) with metastatic bone disease (MBD) from breast cancer (BC). *Cancer Res* 2012; **72** (suppl 3)**:** abst P3-13-01.
10 Amadori D, Aglietta M, Alessi B, et al. Efficacy and safety of 12-weekly versus 4-weekly zoledronic acid for prolonged treatment of patients with bone metastases from breast cancer (ZOOM): a phase 3, open-label, randomised, non-inferiority trial. *Lancet Oncol* 2013; published online May 16. http://dx.doi.org/10.1016/S1470-2045(13)70174-8.

Asbestos is not just asbestos: an unrecognised health hazard

About 107 000 people die every year from mesothelioma and other asbestos-related diseases.[1] Although all asbestos fibres have been declared carcinogenic, ambiguity exists regarding the definition of asbestos and about which fibres should be regulated.[2] Roughly 400 minerals arise naturally in a fibrous form (table).[3] Of these, only six (actinolite, amosite, anthophyllite, chrysotile, crocidolite, and tremolite) are regulated because, at the time when regulations were introduced, these were the only mineral fibres used commercially, based on the assumption that only commercial use could lead to widespread substantial human exposure.

Asbestos has many definitions depending on context. The commercial definition is based on its industrial properties; mineralogical and geological definitions describe asbestos according to its shape, chemical composition, and physical properties; regulatory definitions identify minerals to be regulated; and analytical definitions give rules according to fibre count. From a public health and media perception, the generic term asbestos evokes the notion of fibrous minerals causing disease.

Several groups of silicate minerals have a fibrous form, including serpentine, amphibole, zeolite, or palygorskite.[3] Colloquially, the term asbestos is used to qualify fibres that possess physical properties similar to commercial asbestos. Similarly, the WHO definition of asbestos included all fibres with the physical and chemical properties of commercial asbestos. Nevertheless, regulatory health agencies regulate only the six commercial varieties of asbestos. This restricted regulation leads the population at large to believe that these six mineral fibres are the only dangerous forms of asbestos.

The main factors in the toxic effects of asbestos are fibre dimension and biopersistence.[4] The potential of the different fibres to cause disease is still a matter of debate, often affected by economic reasons—ie, research funded

by the asbestos industry.[5,6] The absence of a coherent national policy and scientific consensus on the definition of asbestos continues to delay the introduction of more effective protective measures. Mineral fibre pathogenicity is determined by the shape of the fibre. Erionite is regarded as the most potent carcinogenic mineral fibre,[7] but is not defined as asbestos and is therefore not regulated, underscoring the problems caused by the present nomenclature and legislation. Instead, chrysotile is reportedly less carcinogenic than erionite and amphibole asbestos.[5] However, chrysotile causes lung cancer and other respiratory diseases.[6] Although the International Agency for Research on Cancer identified chrysotile as a human carcinogen, it is still mined and sold worldwide, especially in low-income countries where chrysotile imports have increased exponentially during recent years.[5]

	Regulated fibrous minerals	Non-regulated fibrous minerals
Serpentine	Chrysotile ..	Antigorite Lizardite
Amphiboles	Actinolite Amosite (grunerite) Anthophyllite Crocidolite (riebeckite) Tremolite ..	Arfvedsonite Cummingtonite Fluoro-edenite Magnesio-hornblende Richterite Winchite
Gageite	..	Balangeroite
Wollastonite	..	Wollastonite
Zeolites	.. ..	Erionite Mordenite
Palygorskite-sepiolite	.. ..	Palygorskite Sepiolite
Carlosturite	.. ..	Carlosturite About 375 other fibrous minerals[3]

Table: **Regulated and non-regulated fibrous minerals with carcinogenic characteristics, by mineralogical group**

Regulated and non-regulated fibrous minerals are common in many geological formations.[3] Human activities (eg, the development of rural areas, mining, and road traffic) release airborne fibres, resulting in human environmental exposure. Non-regulated fibres found in the environment are sometimes more dangerous than the six regulated asbestos fibres. For example, asbestiform winchite and richterite contaminated the vermiculite mined from Libby, MT, USA, causing high rates of asbestos-related disease.[8] The Ban Asbestos in America Act of 2007 added winchite, richterite, and all asbestiform varieties of amphibole to the list of regulated asbestos. However, this resolution was never enacted. Fibrous antigorite has been shown to cause asbestosis among nickel workers in Poland.[9] In-vitro and in-vivo studies showed its carcinogenic effect.[10] In New Caledonia, an increased number of mesothelioma cases was related to the distribution of serpentinite containing antigorite fibres. Roads paved with serpentinite were the main source of environmental exposure,[11] leading local authorities to include antigorite in the list of regulated asbestos. Antigorite exposure was also noted in Maryland, USA.[12]

In some Cappadocian villages in Turkey, erionite was used to build houses and pave roads, causing a mesothelioma epidemic.[13] The mineral's highly carcinogenic properties led WHO to classify erionite as a group 1 carcinogen. However, the use of erionite is not regulated. Deposits of fibrous erionite are present in western USA and have been used to pave roads and playgrounds. Traffic on these roads is causing levels of erionite fibre exposure similar to those in the mesothelioma-affected villages in Turkey.[7]

The restricted regulatory definition of asbestos to six fibres used commercially contributes to miscommunication and uncertainty regarding the toxic effects of some fibrous minerals. We propose that all fibrous minerals be handled as potentially pathogenic until they are proven safe. Moreover, to protect human health, a wider regulatory definition of asbestos should include all potentially carcinogenic mineral fibres, without distinction of type and commercial use.

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1 Holmes D. IARC in the dock over ties with asbestos industry. *Lancet* 2013; **381:** 359–61.
2 Case BW, Abraham JL, Meeker G, Pooley FD, Pinkerton KE. Applying definitions of "Asbestos" to environmental and "low-dose" exposure levels and health effects, particularly malignant mesothelioma. *J Toxicol Environ Health B Crit Rev* 2011; **14:** 3–39.
3 Skinner HCW, Ross M, Frondel C. Asbestos and other fibrous materials: mineralogy, crystal chemistry and health effects. New York; Oxford University Press, 1988.
4 Aust A, Cook P, Dodson R. Morphological and chemical mechanisms of elongated mineral particle toxicities. *J Toxicol Environ Health B Crit Rev* 2011; **14:** 40–75.
5 LaDou J, Castleman B, Frank A, et al. The case for a global ban on asbestos. *Environ Health Perspect* 2010; **118:** 897–901.
6 Stayner LT, Dankovic DA, Lemen RA. Occupational exposure to chrysotile asbestos and cancer risk: a review of the amphibole hypothesis. *Am J Public Health* 1996; **86:** 178–86.

7 Carbone M, Baris YI, Bertino P, et al. Erionite exposure in North Dakota and Turkish villages with mesothelioma. *Proc Natl Acad Sci USA* 2011; **108:** 13618–23.

8 Sullivan P. Vermiculite, respiratory disease and asbestos exposure in Libby, Montana: Update of a cohort mortality study. *Environ Health Perspect* 2007; **115:** 579–85.

9 Wozniak H, Wiecek E, Stetkiewicz J. Fibrogenic and carcinogenic effects of antigorite. *Pol J Occup Med Environ Health* 1988; **1:** 192–202.

10 Cardile V, Lombardo L, Belluso E, Panico A, Capella S, Balazy M. Toxicity and carcinogenicity mechanisms of fibrous antigorite. *Int J Environ Res Public Health* 2007; **4:** 1–9.

11 Baumann F, Maurizot P, Mangeas M, Ambrosi JP, Douwes J, Robineau B. Pleural mesothelioma in New Caledonia: associations with environmental risk factors. *Environ Health Perspect* 2011; **119:** 695–700.

12 Rohl AN, Langer AM, Selikoff IJ. Environmental asbestos pollution related to use of quarried serpentine rock. *Science* 1977; **196:** 1319–22.

13 Baris YL, Sahin AA, Orezmi M, et al. An outbreak of pleural mesothelioma and chronic fibrosing pleurisy in the village of Karain/Urgüp in Anatolia. Thorax 1978; **33:** 181–92.

It's time to quit

Dennis Potokar/Science Photo Library

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For the **previous Advertising Standards Agency rulings against JTI advertisements** see http://www.asa.org.uk/Rulings/Adjudications/2013/3/Gallaher-Ltd/SHP_ADJ_208266.aspx and http://www.asa.org.uk/Rulings/Adjudications/2013/4/Gallaher-Ltd/SHP_ADJ_210929.aspx

In July, 2012, Japan Tobacco International (JTI) launched a £2 million advertising campaign in UK newspapers attacking plain packaging for cigarettes. Two rounds of advertisements have already been banned by the Advertising Standards Agency for breaking the rules on misleading advertising and lacking valid substantiation for their claims after complaints were lodged by prominent charities, including Cancer Research UK (CRUK), Action on Smoking and Health (ASH), and ASH Scotland.

Plain packaging for cigarettes has been a topic closely followed by this journal, and we support the action that these charities are taking to stop the continued dissemination of misinformation surrounding the issue. Interestingly, although tobacco advertising has been illegal in the UK since 2002, advertising a particular opinion on a topic—in this case plain packaging—is acceptable. This loop hole in the regulations needs to be closed and is clearly not in the spirit of the WHO Framework Convention on Tobacco Control. Furthermore, the UK newspapers that have happily taken JTI's money to run the current advertisements should be ashamed of themselves for putting a small additional revenue stream above moral and ethical responsibilities.

The most recent series of adverts (which appeared widely in many UK newspapers in the past week) have again attempted to imply that there is no evidence that plain packaging reduces the appeal of cigarettes, by reproducing a 2011 letter between civil servants in the UK and Australia obtained under the Freedom of Information Act. However, the inferences are fallacies because there is very clear evidence that branding of cigarette packages makes them more appealing to young people,[1] and their importance as a marketing method has been acknowledged by tobacco bosses.[2] Since the introduction of general advertisement and sponsorship bans, tobacco packets remain one of the few legal marketing methods left available to promote their brands.[3,4]

Australia introduced standard packs in December, 2012, after much opposition and legal challenges from the tobacco industry. Other countries, including Canada, New Zealand, and the UK are considering the implementation of plain packaging. It is obvious that these deliberations have made the tobacco companies extremely anxious, to the extent that they are attempting to not only lobby governments behind closed doors, but are also taking their campaigns into the public domain. Thankfully, a recent online survey by CRUK suggests that there is very little public trust for tobacco companies.[5]

The rapidly growing burden of cancer is one of the major challenges impeding the provision of effective health-care services around the world. One simple action to reduce this burden is to stop people from becoming addicted to known carcinogens. The cynical lobbying of the tobacco companies—and their renewed attempts to sway public opinion with misleading advertising—to continue to market a substance that is known to be a leading cause of cancer should not be tolerated. Enough is enough, it's time to quit.

The Editors

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1 Moodie C, Stead M, Bauld L, et al. Plain tobacco packaging: a systematic review. Public Health Research Consortium: London. http://phrc.lshtm.ac.uk/project_2011-2016_006.html (accessed April 19, 2013).

2 Brown and Williamson. Remarks of TE Sandefur. Richland national rollout trade briefing. July 23, 1985. Bates no. 52001904/1918. http://legacy.library.ucsf.edu/action/document/page?tid=noi24f00 (accessed April 19, 2013).

3 Hastings G, Galopel-Morvan K, Rey JM. The plain truth about tobacco packaging. *Tob Control* 2008; **17:** 361–62.

4 Moodie C, Hastings G. Tobacco packaging as promotion. *Tob Control* 2010; **19:** 168–70.

5 Cancer Research UK. Public slams tobacco industry as untrustworthy. April 12, 2013. http://www.cancerresearchuk.org/cancer-info/news/archive/pressrelease/CR_095712 (accessed April 19, 2013).