

LETTER TO THE EDITORS

DOI: 10.2427/11367

Accepted on 22 June, 2015

Dear Editors,

we read with surprise and concern the paper published by Ilgren et al [1].

The explicit purpose of this paper is to exclude the role of chrysotile in the mesothelioma epidemics among workers of the former San Vittore mine (Amiantifera di Balangero) and inhabitants in the Balangero area. In search of other causes, gross mistakes have been made by Ilgren et al. The paper is full of statements that have no substance and lack support of evidence. We will comment the most important ones.

The mine is one of the few chrysotile mines where pure chrysotile is obtained, with the only exception of balangeroite – a local, low persistency, non-amphibole mineral fiber – that occurs in very minor amounts [2,3], in the order of 0.2 – 0.5% of total extracted chrysotile [4].

Tremolite outcrops are occasionally present in some locations of the Piedmont Region area, but not close to the actual mine location. The outcroppings of tremolite reported by Ilgren et al. in the Susa Valley are separated from the Balangero area by a line of mountains exceeding 2000 m. The other outcrops mentioned by Ilgren et al in Trana or Val Macra are at even greater distance and separation from Balangero, as everyone can easily check on a map. In any case, tremolite was not reported as a contaminant of Balangero chrysotile. Similar conclusions (misreported by Ilgren et al) were presented by Pira et al, ref 15 in Ilgren et al [3]: *“Examination of several samples of chrysotile from the mine ruled out the presence of contamination with fibrous amphiboles at detectable concentrations”*.

There is no trace in the whole body of the Western Alps of natural sources of the other amphiboles, e.g. crocidolite and amosite, contrary to statements by Ilgren et al., for the following reasons. Amosite, the asbestiform variety of grunerite, is a characteristic mineral of metamorphosed iron-rich siliceous sediments [5]. Crocidolite, the asbestiform variety of riebeckite, is typical of the “banded ironstones” of South Africa or the equivalent “banded iron formations” of Western Australia [5]. Both asbestiform minerals are naturally unknown in the Western Alps, because they were formed in peculiar geologic environments lacking in Italy. This is especially true for the Balangero mine that occurs in a serpentinised mantle peridotite, i.e. in a lithology whose bulk chemical composition is far from those suited to grow amosite or crocidolite.

Ilgren et al. appear unfamiliar not only with the geology of the area, but also with the roads, as no one familiar with the roads could ever imagine workers commuting from Balangero to Casale Monferrato. Ilgren indicates as a matter of fact that: Balangero was not too far from Casale Monferrato, that the Balangero mine interrupted activities in winter and that an unspecified number of Balangero miners commuted for ‘moonlight work’ to Casale Monferrato. None of these statements is supported by any evidence and all are unlikely or false. As for the distance: the shortest travelling distance from Balangero to Casale Monferrato is 97 km: nowadays travelling by car from Balangero to Casale Monferrato takes an estimated time of 1 h and 37 min (<http://www.viamichelin.it>) and a cost of 14.5 € for fuel and tolls alone. Travelling by public transport nowadays takes over 3 hours, one way. As for the mine activity in winter: the mine area ranges from 600 to 800 m above the sea level (http://it.wikipedia.org/wiki/Amiantifera_di_Balangero); except for rare heavy snow falls, the mine was active all the year round, as clearly documented by the reports, the documents of the court trial that took place in Ciriè [6] and the dates of asbestos sampling campaigns. As for the evidence: the Mesothelioma Registry of Region Piedmont investigates occupational and residential history of mesothelioma cases and we have followed-up the cohort of Eternit workers of Casale Monferrato; neither source got any indications of commuting as suggested by Ilgren et al and moreover we did

not record Eternit workers coming from the Balangero area. None of the reported cases of MM from the Balangero mine ever worked in Casale Monferrato Eternit plant.

Ilgren et al suggest that large amounts of crocidolite were used in Balangero, with repeated statements not supported by sound references. 1) Ilgren quotes ref 11 in [1] as: ‘...*Crocidolite and amosite were also transferred to Balangero in Jute bags*’. Ref. 11 does not include such a statement and does not include ANY statement supporting the use of crocidolite and amosite. The quotation is false. 2) Another quotation is from a letter by K Browne (ref 25 in [1]): Browne quoted a ‘personal communication’ by Prof. U. Gruber from Zurich (an Eternit consultant) and not a verifiable document. 3) We perused the documents in our archive and the documents and transcripts of the court trial that took place in Ciriè [6], in particular the proceedings including detailed descriptions of the mine, the materials and the work processes. The only mention we could find of crocidolite use regards a test carried out in 1978 or 1979: a pilot disaggregator was set up where a batch of raw crocidolite was treated during a working week on behalf of Eternit – a major customer of Amiantifera. Eternit provided the raw crocidolite. After the test ended, no further use of crocidolite ensued. 4) A different statement was reported by Pira et al [3], not corresponding to the report in Ilgren et al: “*It was reported in a trial sentence (ref 19 in [4]) that crocidolite asbestos was present at Balangero mine occasionally and for short periods, mainly for material testing and preparing mixtures. However, there was no evidence from the exposure histories of workers with pleural cancer, obtained from personnel records, that they were exposed in such operations*”. 5) Regarding table 1, presenting the amphibole content of some lung samples allegedly corresponding to Balangero workers and residents (with no details on analyses methods provided in Ilgren et al paper), our information does not associate those samples to Balangero. Those were unnamed lung samples sent for analytical comparisons. In any case, we were appalled by the high lung burden of chrysotile.

Ilgren et al noticed high asbestos contamination in the Torino urban area. According to them it would be an explanation for high relative risks of mesothelioma in Balangero as well as in other areas (ref 12 in [1]). According to basic epidemiological methodology, Ilgren et al statement is nonsense: the occurrence of mesothelioma cases in Torino would increase the background disease incidence and therefore would reduce the relative risk for Balangero workers and residents. The Balangero mine usually employed a local workforce, and in the case series presented by Mirabelli et al [7] only one case had relevant employment periods in other industries with possible asbestos exposure. Moreover, as for the origin of asbestos in Torino, we should remember that serpentine rocks from the mining site still containing 1% of chrysotile were regularly sold by the Balangero mine for the preparation of roads, rails and foundation beds for tramway lines, and major purchasers included Italian railways and the companies building tramways and underground lines.

Ilgren et al claim that quality of diagnostic assessment was poor in the papers by Rubino et al [8], Piolatto et al [9] and Pira et al [4] but neglect to discuss the quality of diagnosis of mesothelioma cases in the report by Mirabelli et al [7], where 9 cases are reported, of which 7 with histological or cytological diagnosis, in 4 cases (2 and 2 respectively) with immunohistochemical diagnosis. A more recent report by us [10] showed 3 additional mesothelioma cases (2 with histological diagnosis, of which 1 with immunohistochemical confirmation) and an estimated Relative Risk of Mesothelioma in the Balangero Miners cohort of 5.6 (95% CI 2.6 to 10.7), with reference to the Piedmont Region population.

Ilgren et al argue that Balangero workers were not exclusively miners, that word not being used in reported papers. In a mine not all workers are face workers (strictly defined “miners”): in fact Balangero cohort workers were involved in milling, transportation, bagging and maintenance as well as excavation. Dust measurements did not show large differences among those working areas [11].

Ilgren et al paper is full of other mistakes that we cannot report in full, such as misprints, wrong quotations, and statements with no supporting evidence. Two further examples are given: the report by Ronco et al (ref 24 in Ilgren et al.) was a case control study on lung cancer, and not on mesothelioma and therefore the quotation is misleading; Maule, Silvestri and Compagnoni have their surname systematically mistyped. These mistakes are also an indication of the sloppiness in writing the paper and in revising it.

LETTER TO THE EDITORS

In summary, Ilgren et al paper is an example of a poor quality paper, with no scientific content, that a scientific journal should never publish.

Yours truly,

Corrado Magnani (1,2)

Dario Mirabelli (2,3)

Francesco Barone-Adesi (4)

Roberto Calisti (5)

Roberto Compagnoni (2,6)

Bice Fubini (2,7)

Stefano Silvestri (8)

Benedetto Terracini (2,3)

1. Cancer Epidemiology Unit, Dept. of Translational Medicine, University of Eastern Piedmont and CPO-Piemonte, Novara, Italy
2. Centro Interdipartimentale "G. Scansetti" per lo Studio degli Amianti e di altri Particolati Nocivi, Università di Torino, Torino, Italy
3. Unit of Cancer Epidemiology, CPO-Piemonte and Department of Medical Sciences, Università di Torino; Torino, Italy
4. Department of Pharmaceutical Sciences, University of Eastern Piedmont, Novara, Italy
5. ASUR MARCHE - Servizio Prevenzione e Sicurezza negli Ambienti di Lavoro (SPreSAL) Civitanova Marche, (Italy)
6. Dipartimento di Scienze della Terra, Università di Torino, Torino, Italy
7. Dipartimento di Chimica, Università di Torino, Torino, Italy
8. ISPO, Firenze, Italy

Conflict of interest statement

CM, DM, FBA, RC, SS and BT served as expert witness for the public prosecutor in asbestos related cases, including a trial on asbestos related diseases in Balangero workforce and residents (CM, DM, SS).

References.

- [1] Ilgren EB, Pooley FD, Kumiya YM, Hoskins JA Critical reappraisal of Balangero chrysotile and mesothelioma risk. *Epidemiology Biostatistics and Public Health*. 2015; 12:e10125-1
- [2] Compagnoni R, Ferraris G, Flora L. Balangeroite, a new fibrous silicate related to gageite from Balangero, Italy. *American Mineralogist*, 1983;68:214-219.
- [3] Turci F, Tomatis M, Compagnoni R, Fubini B. Role of Associated Mineral Fibres in Chrysotile Asbestos Health Effects: The Case of Balangeroite. *Ann. Occup. Hyg.* 2009; 53 : 491-497.
- [4] Pira E, Pelucchi C, Piolatto PG, et al. Mortality from cancer and other causes in the Balangero cohort of chrysotile asbestos miners. *Occup Environ Med.* 2009;66:805-9.
- [5] Deer W.A., Howie R.A., Zussman J. (1963): Rock-forming minerals. Vol. 2. Chain silicates. Longmans, 379p.
- [6] Repubblica Italiana, Pretura Circondariale di Torino, Sezione Distaccata di Cirie. Verdict issued on April 14th, 1997. Registered litigation sentence no. 135/97.
- [7] Mirabelli D, Calisti R, Barone-Adesi F, et al. Excess of mesotheliomas after exposure to chrysotile in Balangero, Italy. *Occup Environ Med.* 2008;65:815-9.
- [8] Piolatto G, Negri E, La Vecchia C, et al. An update of cancer mortality among chrysotile asbestos miners in Balangero, northern Italy. *Br J Ind Med.* 1990;47:810-4.
- [9] Rubino GF, Piolatto G, Newhouse ML, et al. Mortality of chrysotile asbestos workers at the Balangero Mine, Northern Italy. *Br J Ind Med.* 1979 ;36:187-94.
- [10] Magnani C, Mirabelli D, Brentisci C, Gangemi M, Stura A, Terracini B Malignant mesothelioma after exposure to chrysotile in Balangero, Italy: an update. 12th International Mesothelioma Interest Group Conference 21 - 24 October 2014, Cape Town
- [11] Silvestri S, Magnani C, Calisti R and Bruno C. The experience of the Balangero chrysotile asbestos mine in Italy. Health effects among workers mining and milling asbestos and the health experience of persons living nearby. Italy. *Can Mineral.* 2001, spec. publ. 5:177-186