



MALIGNANT PLEURAL MESOTHELIOMA : CURRENT STATUS AND FUTURE PROJECTIONS IN TURKEY

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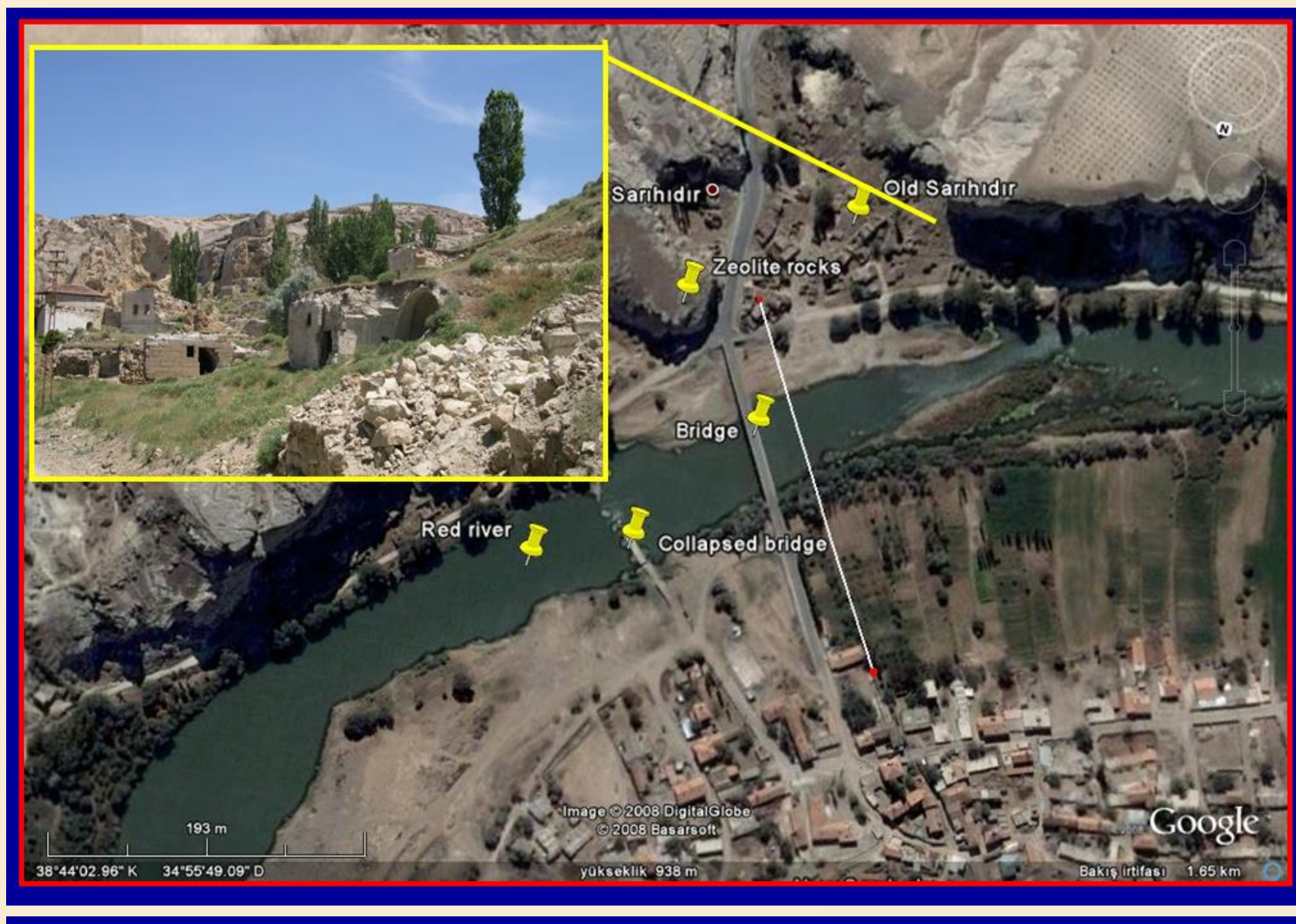
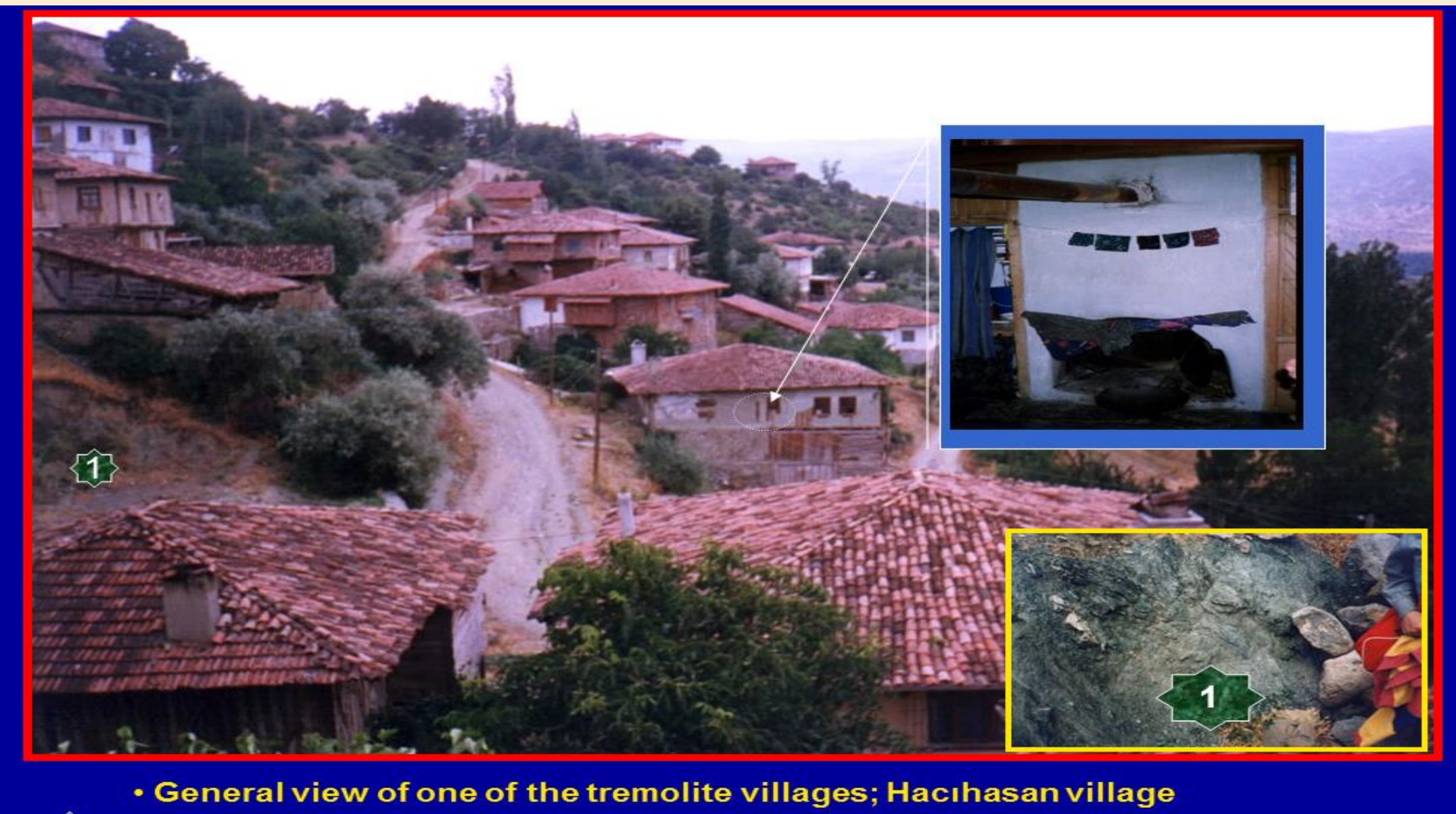
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Malignant Mesothelioma Problem in Turkey

Malignant pleural mesothelioma (MPM) is still a public health problem in Turkey mainly due to environmental fibrous mineral exposure (FME; tremolite asbestos, erionite). Total incidence of MPM was estimated as 7.8 per 1 million inhabitants in Turkey. Estimated annual incidence of mesothelioma in Turkey related to environmental exposure was approximately less than 1000 cases per 100.000 people in the erionite villages and 50 cases per million in Southeast Turkey. The fiber analysis results in tissues obtained from patients with different diagnosis in Zeolite villages is seen in Table 1.

Several international collaborative projects focused to screen and detect new cases in the high-risk group in the Cappadocia region. However risk of developing occupational mesothelioma is increasing due to extensive usage of asbestos in industry. Based on asbestos production and consumption data of U.S. Geological Survey , Turkey had imported a total amount of 350,000 tons of asbestos between 1940-2013. Therefore we expect to diagnose 350 new occupational MPM cases per year especially after 2015 till 2040.



Erionite villages in Cappadocia region



Illegally operated erionite quarries in Karacaören village and erionite fibers under electron microscopy.

Turkey Asbestos Consumption Trends from 1940 to 2003

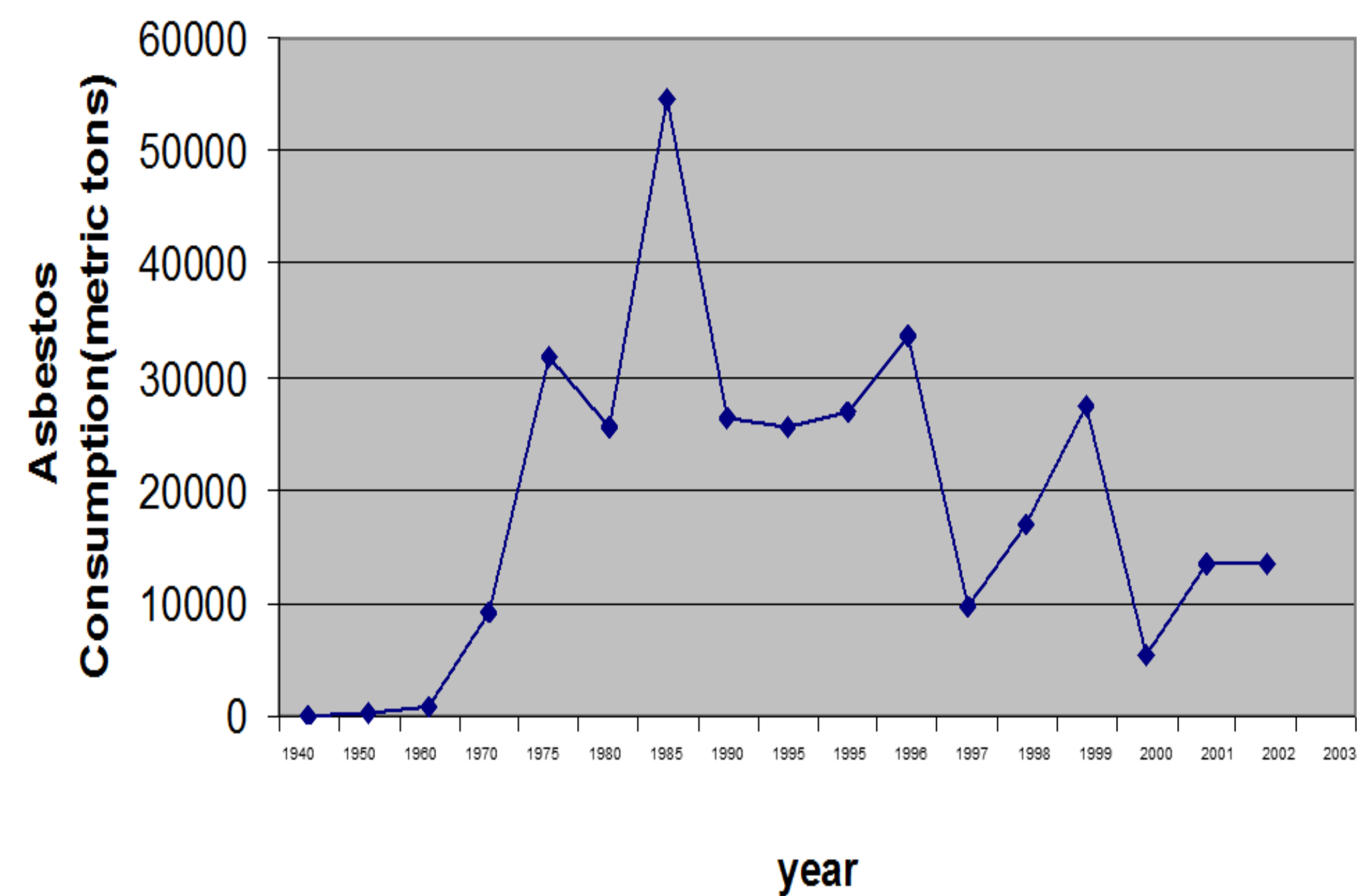


Table 1. Fiber analysis results in tissues obtained from patients with different diagnosis in Zeolite villages

Fibre Analysis Studies in Zeolite Villages						
Name	Sex	Information	CRY	CROC	FIB2	Others
AA	M	Pleural plaque no tumor cells, S	(+)			
FA (BALF)	F	Lung tissue, Tube A no tumor cells,	3,42	N.D	17,08	N.D
GB	F,44	Normal lung	1,33	N.D	1,67	N.D
KS	F, 45	Interstitial fibrosis	1,55	N.D	4,51	1
SG	F, 65	MM patient + fresh frozen tumor tissue and normal tissue #B5, B6, B7, B8, Family (18) + #44 DNA from whole blood. Very congested lung + areas of desquamatus pneumonia and atelectasis	1,37	N.D	1,37	0
AI		Lung and tumor but 80% lung tissue.	1,75	N.D	13,75	2
AI	F,46	(S)Pleural plaque with foci of inflammation and epithelioid epith 90% is PP	3,63	N.D	N.D	1

Methods: We retrospectively reviewed the reachable files of MPM patients who were admitted to Department of Chest Diseases in Hacettepe University between 1972 -2010. Baseline patient characteristics were recorded. The study included 484 patients with MPM (M/F: 310/174) with a mean and median age of 52.3 and 52 years (range: 14-80), respectively.

Table 2: Sociodemographic and clinical features of patients

Gender (n=484)*	
Male	310 (36.0)
Female	174 (64.0)
Age (n=481)*	51.38±11.65 (14-80)
Smoking Status (n=347)*	
Smoker	186 (53.6)
Non-smoker	161 (46.4)
Exposed Fibrous Mineral (n=348)*	
Asbestos	260 (74.7)
Erionite	88 (25.2)
Diagnostic method (n=93)**	
Invasive procedure	
Thoracotomy	15 (16.1)
Pleurectomy/Decortication	11 (11.8)
Omentectomy	1 (1.1)
Minimal invasive procedure	
Video assisted thoracoscopic surgery	6 (6.5)
Medical thoracoscopy	10 (10.8)
Pleural biopsy	47 (50.5)
Tru-cut biopsy	3 (3.2)
Location of tumor (n=122)*	
Right pleura	72 (56.7)
Left pleura	55 (43.3)
Histology of tumor (n=83)*	
Ephiteloid	69 (83.1)
Sarcomatoid	2 (2.4)
Mixed	12 (14.5)
Date of diagnosis (n=249)*	
1975-1979	21 (8.4)
1980-1984	24 (9.6)
1985-1989	64 (25.7)
1990-1994	52 (20.9)
1995-1999	27 (10.8)
2000-2004	21 (8.4)
2005-2010	40 (16.1)

Data are presented as n(%) or mean±SD (range).

*Number of patient whose data were reached in the files.

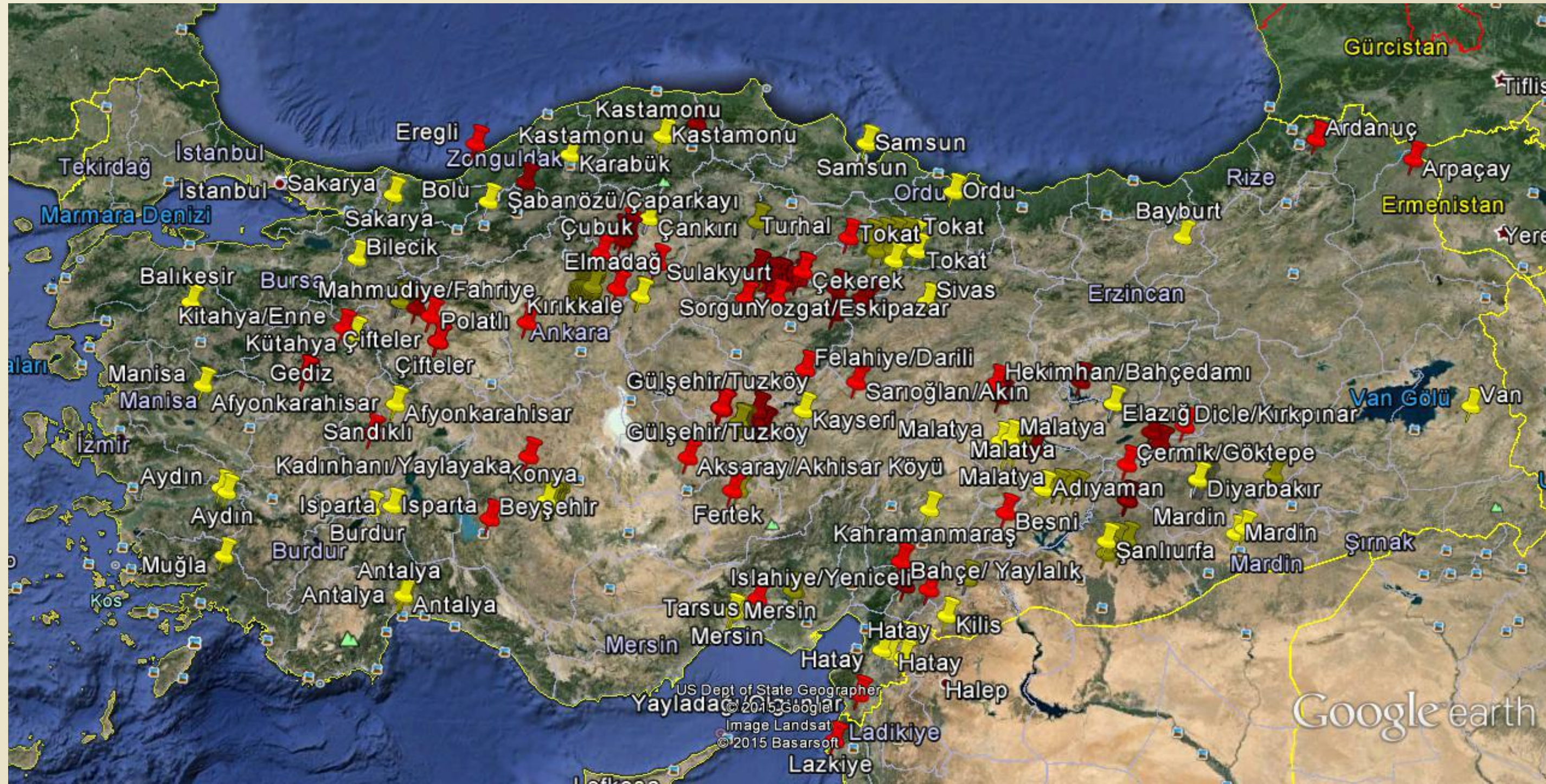
Results: The study included 484 patients (M/F:310/174) with a mean age of 51.3 years (range:14-80). Sociodemographic and clinical features of patients are demonstrated in Table 2. The ratio of patients <40 years was 16.5%. Right hemitorax were commonly (56.7%) affected and epithelial histology was dominant (83.1 %). Whereas 72% of patients had a history FME, 74.7% of these patients had asbestos and 25.2% had erionite exposure. Patients were born mainly in 9 cities and their birth places were pointed on map to detect Turkey's risk regions (Table 3 and Figure 1).

Table 3. Places of births of patients with MPM included in the study

Place of birth (n=376)*	N (%)
Nevşehir	72 (19.1)
Ankara	54 (14.4)
Diyarbakır	33 (8.8)
Yozgat	28 (7.4)
Elazığ	19 (5.1)
Eskişehir	18 (4.8)
Çankırı	16 (4.3)
Konya	12 (3.2)
Tokat	12 (3.2)
Others	112 (29.8)

*Number of patient whose data were reached in the files.

Figure 1. Cities of birth of patients included in the study, with diagnosis of MPM pointed on Turkey's map obtained from Google Earth.



Conclusion: This study presented that currently MPM is mostly due to environmental FME. Although preventive measures were taken obtained by educating villagers to avoid using asbestos contaminated soil for domestic usages and relocating the erionite villages in Cappadocia region, in the future we expect to diagnose higher occupational cases.

Turkey started National Strategic Plan for Asbestosis Management and Awareness, and ILO Safety and Health Construction Convention, 1988 (No: 167) was powered by 5 February 2015 , which is important for city reorganization process.

However, illegally operated erionite quarries in Karacaören region is of concern for risk of new MPM cases. Secondly, Turkey had imported a total amount of 350,000 tons of asbestos between 1940-2013, thus we expect to diagnose 2000 new occupational MPM cases (350 cases per year) especially after 2015 till 2040. City reorganization attempts is also another concern leading to environmental exposure.

References

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