



DIRECTORATE
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HEALTH EFFECTS OF THE VOLCANIC ERUPTION IN EYJAFJALLAJÖKULL



Volcanic ash in the atmosphere at Heimaland, a community centre near Eyjafjallajökull, on 4 June 2010. Photo: Hanne Krage Carlsen.

The volcanic eruption in Eyjafjallajökull started in mid April 2010 and was over by end of May the same year. During the six weeks of eruption huge amounts of ash fell to earth, mainly to the south and southeast of the volcano, but some ash fall was also detected north of the volcano. It is assumed that ash on the ground will continue to cause some problems as it is blown around in the coming months.

It is important to gather information on the human health consequences of the eruption in order to assess the value of the protective measures taken. The first medical investigation was undertaken on 12 residents in the exposed area on 20 April, only five days after the eruption started. Almost all of them suffered from mild symptoms of the eyes, nose and pharynx but otherwise they were in good health. Two of them, with known asthma, had respiratory wheezing, possibly due to insufficient medication (Epi-Ice, Vol. 6, Issue 2, 2010).

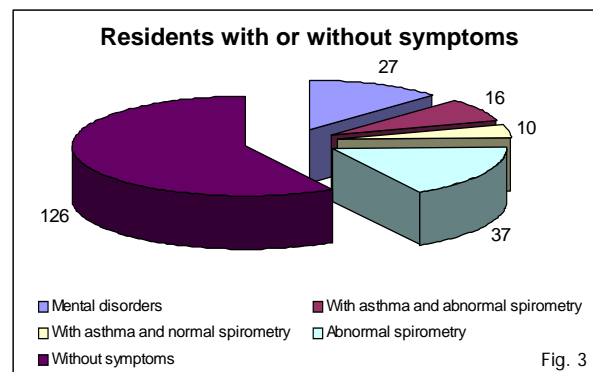
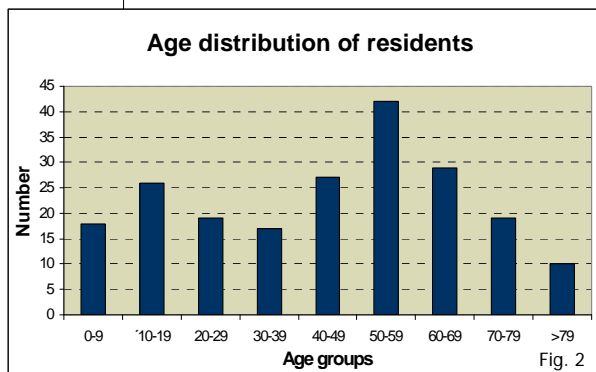
The next step was a more comprehensive medical investigation among the inhabi-

tants of a larger portion of the exposed area south and south-east of the volcano, from the river Markarfljót to the west to the village of Vík to the east. The Chief Epidemiologist in collaboration with experts from the Department of Lung Diseases at Landspítali University Hospital and local health-care workers conducted a medical ex-

amination of the exposed residents, involving spirometric measurements, blood sampling and questionnaires regarding physical and mental symptoms. The examination of 207 residents took place from 31 May to 11 June 2010, of whom 100 were males and 107 women. The mean age was 44 years, for age distribution see fig. 2 (p. 2).

The data from this investigation are still being processed but preliminary results indicate that 60% were in good health and without any symptoms during the investigation, 18% had reduced respiratory capacity according to spirometric measurements and 13% had a history of asthma or other lung diseases. Of those who had history of asthma or lung disease, 38% had normal respiratory capacity indicating sufficient medical treatment. Mental distress was reported by 13%, most of whom had mental problems also before the volcanic eruption. No one showed any signs of serious health disorders. The numbers of residents with or without symptoms are shown in fig. 3 (p. 2)

Cont. p. 2



The results of this investigation indicate that the public health measures were effective.

In accordance with the findings of the initial investigation, many residents experienced symptoms from the eyes, throat, the respiratory system and the nose (ca. 38–40%) during ash fall. The protective respiratory masks provided were considered useful as well as the eye goggles used outdoors during ash fall or blow. Some of the residents pointed out that the ash had been more irritating during the first phase of the volcanic eruption than later on. Relatively few complained of skin irritation (4%).

The results of this investigation indicate that the public health measures were effective. Respiratory masks used outdoors during ash fall or blow reduced irritation from the respiratory system while relatively fewer made use of eye goggles. Almost half of the residents examined answered questions about the usefulness of service centres. Most of them were satisfied with the services provided.

The results also indicate the importance of medical attention and follow-up of people with underlying diseases, especially respiratory diseases, and those with known mental disorders.

The Minister of Health has appointed a special steering group assigned to prepare a scientific study on the health effects of the volcanic eruption in Eyjafjallajökull. This study will cover residents from a much larger area than the present investigation, i.e. all residents living in the area east of the river Thjorsa and west of the river Skeidara. The study is planned to go on for many years, which is important considering how little information is available on the long-term effect of volcanic ash on human health.

Haraldur Briem

VACCINATION AGAINST PNEUMOCOCCAL INFECTION PLANNED

The Minister of Health has decided to issue call for tenders for vaccines for childhood vaccination against pneumococcal infections scheduled to start in 2011 in Iceland among children born that year. The Icelandic parliament, Althingi, concluded in June 2010 that vaccination against pneumococcal infection should be implemented in Iceland.

Previously, the National Committee on Communicable Diseases had made a recommendation to the effect that the next addition to the National Childhood Vaccination Programme should be vaccination against pneumococcal disease. The Committee re-

ferred to comprehensive investigations abroad indicating the cost-effectiveness of such an undertaking. Childhood vaccination against pneumococcal disease is cost-effective because of the indirect effect on unvaccinated individuals, among other things. To put the cost-effectiveness of this vaccination in children into perspective, the cost on every year of life saved is estimated \$ 3.300. By comparison, the cost of every year of life saved by means of vaccination against HPV infection and cervical cancer is estimated at \$ 21.000–\$ 83.000 depending on the method of discounting.

Serious pneumococcal infection will be reduced up to 91% among children younger than 5 years of age every year.

Acute otitis media in children under 2 years will be reduced up to 24% every year and tympanostomy tube placements up to 31%.

Vaccines against pneumococcal infections

The Chief Epidemiologist has investigated available vaccines against pneumococcal infections currently on the market in Iceland in connection with the tender.

These vaccines are Synflorix® and Prevenar 13®. Synflorix is a protein-conjugated vaccine with antigens against 10 capsular pneumococcal serotypes and additionally with antigens against non-typeable H. influenzae which is considered a pathogen of importance in otitis media and pneumonia. Prevenar 13 is a protein-conjugated vaccine with antigens against 13 capsular pneumococcal serotypes.

These properties and the cost of each vaccine will be assessed before a decision is made which one is the appropriate vaccine for the childhood vaccination.

Consequences of pneumococcal infections

Pneumococcal infections can be serious and life-threatening for children and adults, especially the very young and the elderly. The incidence of serious infections in Iceland seems to be higher than in many neighboring countries but similar to that in the USA.

The evidence shows that the vaccination substantially reduces the incidence of pneumococcal infections among those vaccinated. Due to the so-called herd immunity there is also a reduction in the incidence among those who are not vaccinated. A drawback of the total result of the vaccination, however, is that the incidence may rise due to serotypes not covered by the vaccine. The pneumococcal vaccines are as safe as other vaccines in the childhood vaccination programme.

The effect of the vaccination

It is important to assess the effect of pneumococcal vaccines on invasive infections due to pneumococci, on otitis media, pneumonia and drug-resistant pneumococcal infections. The effect of antimicrobial consumption must also be assessed. The epidemiology of these diseases and the role of pneumococci and the H. influenzae in their pathogenesis is not fully understood. The vaccination is intended to prevent infections caused by these bacteria. The assessment of

the effect of the vaccination is based on information from worldwide studies on the one hand and on estimates of certain essential parameters on the other.

The estimated impact of pneumococcal vaccination in Iceland after its implementation at 3, 5, and 12 months of age is as follows:

1. Serious pneumococcal infection (invasive) will be reduced up to 91% (10 of 11) among children younger than 5 years of age every year and up to 37% (14 of 38) among older non-vaccinated groups due to indirect effects of the vaccination.
2. Up to 35% of deaths due to pneumococci will be prevented (2 of 5.7) each year in all age groups (vaccinated and unvaccinated) and of these, 95% (0.38 out of 0.4) of deaths in children under the age of 5.
3. Acute otitis media in children younger than 2 years of age will be reduced up to 24% (2.100 of 9.000) yearly, chronic otitis media up to 24% (220 of 900) and tympanostomy tube placements up to 31% (200/640).
4. Pneumonia in children will be reduced up to 37% (250 of 400) every year.
5. Antimicrobial consumption among children younger than 2 years of age will be reduced up to 23% yearly, which means saving costs by \$ 57.000 (VAT included), based on retail prices in April 2010 and consumption in 2009.
6. The effect on the spread of antimicrobial-resistant pneumococci is difficult to assess but the spread will probably be reduced mainly due to reduced consumption of antimicrobials.
7. The effect of the two vaccines mentioned above will be somewhat different due to their different composition. One of them includes antigens of 13 capsular serotypes and may therefore have a more beneficial effect on pneumococcal infections than the other one, which only includes antigens of 10 capsular serotypes. On the other hand, the vaccine with fewer serotypes may have a greater impact on infections where H. influenzae plays a role, e.g. in otitis media, and therefore could have the effect of reducing antimicrobial consumption in general.

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