



Çomo N, Meta E, Qato M, Kraja Dh, Pipero P, Fico A. Measles, a re-emerging disease in Albania: Epidemiology and clinical presentations (Original research). SEEJPH 2022, posted: 04 February 2022. DOI: 10.11576/seejph-5198

## ORIGINAL RESEARCH

### **Measles, a re-emerging disease in Albania: Epidemiology and clinical presentations**

**Najada Çomo<sup>1</sup>, Esmeralda Meta<sup>1</sup>, Migena Qato<sup>1</sup>, Dhimiter Kraja<sup>1</sup>, Pellumb Pipero<sup>1</sup>, Albana Fico<sup>2</sup>**

<sup>1</sup> Service of Infectious Diseases, University Hospital Centre “Mother Teresa”, Tirana, Albania;

<sup>2</sup> Institute of Public Health, Tirana, Albania.

**Corresponding author:** Najada Çomo, MD, PhD;  
Address: Rr. “Dibres”, No. 371, Tirana, Albania;  
Telephone: +355692492756; Email: nadacomo@yahoo.com

## Abstract

**Aim:** Measles is a highly contagious disease caused by the measles virus. Albania is one of many European countries that have successfully interrupted endemic transmission of this disease. However, during the years 2018-2019, an outbreak of measles occurred in Albania. The aim of this study was to describe the clinical features and complications of hospitalized measles patients in Tirana, Albania, as related to age-group and risk factors.

**Methods:** All patients hospitalized for over 24 hours from January 2018 to December 2019 at the Service of Infectious Diseases, University Hospital Centre “Mother Teresa” in Tirana were included in this study. We included patients over 14 years old as this is an Infectious Diseases Service for adult patients only. Clinical and laboratory data were analysed.

**Results:** Of the 318 hospitalized patients (139 females), about 35%, 26%, 17%, 14%, and 7% were 15-24, 25-34, 35-44, 45-54, and over 55 years old, respectively. Females constituted 37% of the total number of patients. The average and median ages were 30.9 years and 28.5 years, respectively. Average time from the first symptom to the hospital presentation was 3.8 days. Contact with other patients with measles was noted in 21% of the patients. Body rashes were identified as maculopapular in 96% of the patients. Pathognomonic enanthema or Koplik spots and conjunctivitis were detected in 62% and 52% of the patients, respectively. Measles-related complications were noted in 53% of the patients; pneumonia/pneumonitis, hepatitis, neurological complications were presented by 24%, 26%, and 3% of the patients, respectively. Average duration of hospitalization was 5.4 days, whereas mortality was 0.3%.

**Conclusion:** This study provides valuable evidence about the distribution and clinical features of measles in Albania. Measles is a highly contagious disease and, as long as the measles virus is circulating, the risk of transmission remains high.

**Keywords:** Albania, fever, Koplik spots, maculopapular, measles.

**Conflicts of interest:** None declared.

## Introduction

The widespread use of safe and cost-effective measles vaccines in national immunization programs globally since 1974 has resulted in a marked decrease in measles cases. In line with this, all regions of the World Health Organization (WHO) had established goals to eliminate measles by 2020 which, at first sight, seemed achievable (1). Yet, over the last decade, measles outbreaks have been widely reported throughout Europe, but not in Albania. In Albania, measles has been a mandatory reportable disease since 1945. The main epidemic spread of measles in Albania occurred in 1955, followed by another between the years 1970–1971 with 48,156 reported cases, and then in April 1989 and 1990 with a total of 168,636 reported cases and 44 reported deaths. Several cases were reported by the Institute of Public Health (IPH), Albania from 1990-2000. In 2000, the Ministry of Health of Albania endorsed the National Plan for Measles Elimination 2000-2007, and in the last two decades the cases have been almost inconspicuous (2). So true was it, that young doctors almost forgot about measles. The re-emergence of measles in populations with insufficient vaccine coverage has changed its epidemiology from its past pattern of seasonal epidemics in young children to susceptible individuals. Clinically, measles is a highly contagious human infectious disease. It can lead to serious complications and often requires hospitalization (3,4). Most people with measles recover uneventfully after approximately 1 week of illness characterized by fever, malaise, coryza, conjunctivitis, cough, and a maculopapular rash (5). Although measles is often a mild disease, it can lead to serious complications such as pneumonia, hepatitis, keratoconjunctivitis, and encephalitis (2-4,6,7).

The objectives of this study were to provide an update on measles hospitalizations reported in Albania during 2018-2019 and describe the clinical presentations and complications of this re-emerged infectious disease.

## Methods

All patients hospitalized for over 24 hours from January 2018 to December 2019 at the Service of Infectious Diseases, University Hospital Centre “Mother Teresa” in Tirana were included in this study.

Measles patients who were presented in the emergency room of the Infectious Diseases Service were excluded. All patients included were  $\geq 14$  years old because this Infectious Diseases Service is only for adult patients.

Case definition for measles was based on clinical presentation, epidemiological data, and serologically confirmed diagnosis. More specifically, a clinical case of measles was defined as fever with the presence of maculopapular rash, Koplik spots, conjunctivitis, cough, and malaise. Serological diagnosis was based on IgM antibody positivity for measles. Demographic, clinical, epidemiological, and laboratory data were collected from patients' files.

## Results

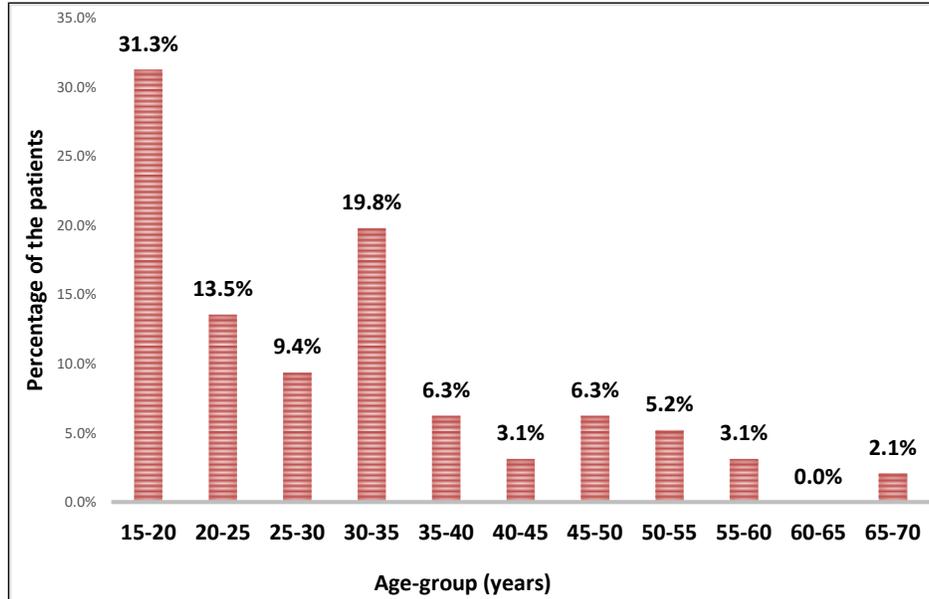
During the study period, more than 2000 people were presented in the emergency room with measles-like symptoms. From these, 1747 tested positive for measles, of whom, 318 patients were hospitalized. Tirana city was the most affected area; of note, Tirana hosts more than one-third of all Albanian citizens.

Of 318 patients, 139 (43.7%) were females and 179 (56.3%) were males. The majority of hospitalized patients, 61.7%, were 15-34 years old, of whom females were 36.8%.

More specifically, about 31% of the patients were 15-20 years old. The distribution of

patients by 5-year age bands is presented in Figure 1.

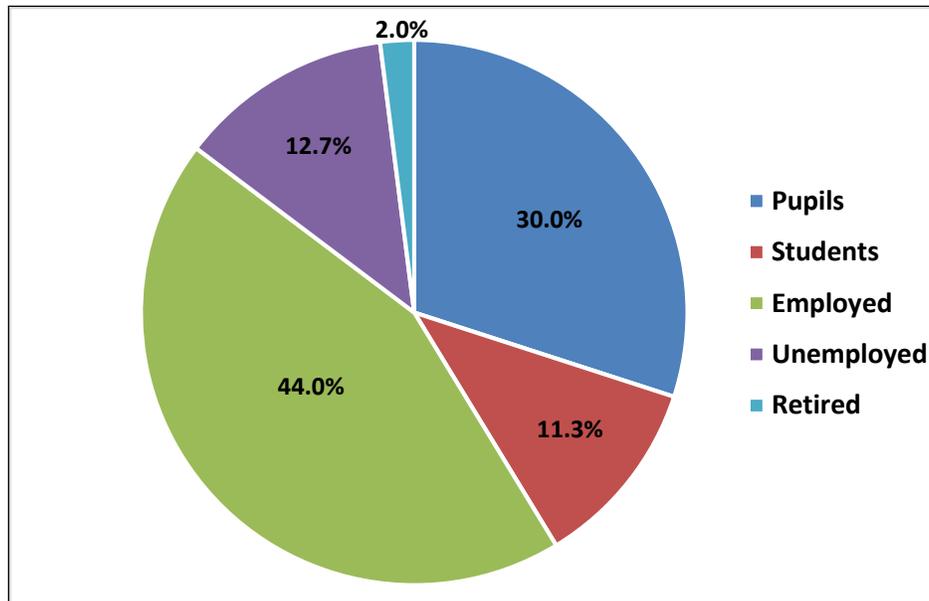
**Figure 1. Distribution of patients with measles by 5-year age bands**



About 13% of the patients were unemployed; 44% were employed; 2% were retired; and

the remaining 41% were pupils (30%) or students (11%) (Figure 2).

**Figure 2. Distribution of patients with measles by social category**



The average time from the first symptom to the hospital presentation was 3.8 days. The major indicators for hospitalization were high fever, respiratory symptoms, head ache, and in a few cases patient isolation. Rash and fever were the most important complaints. Other significant complaints were conjunctivitis and cough. Conjunctivitis was a constant complaint, and was detected in 51.6% of patients. Koplik spots were confirmed in 198 (62.2%) patients. Pulmonary involvement, determined by a chest X-ray, was found in 23.8% of all patients. Overall, mean oxygen saturation in admission was 92.3%; oxygen saturation was <90% in 16 (5%) patients. Two patients developed acute respiratory distress syndrome (ARDS). Leucopenia was detected in 63.5% of patients; deep leukopenia less than 1000/mm<sup>3</sup> was detected in only 13 (4%) of the patients. Platelet counts less than normal value were detected in 113 (40.15%) of cases. Hepatitis was present in 84 out of 318 (26.4%) patients. The intensive care unit admitted four patients. Antibiotic therapy was used in 143 (44.9%) cases. Anti-inflammatory steroid (prednisolone) was used in 105 (33%) cases. The average duration of hospitalization was 5.04 days, and mortality was 0.3% (1 out of 318).

## Discussion

Every abrupt outbreak of infection presents a huge problem not only for the hospital administration, but also for public health. In this study, we described the demographic, clinical, hospital course, and outcomes of patients with measles hospitalized at the Service of Infectious Diseases, University Hospital Centre in Tirana, Albania from January 2018 to December 2019. In our service, we only attend to non-paediatric cases and patients over the age of 14 years old. As shown in Figure 1, the majority of cases belonged to the age group of 15-34

years. This means that lack of vaccination during a certain time has created a gap. Maybe this can be explained by the demographic changes that occurred after the year 1990. During 1990-2010, the demographics of Albania changed as a result of uncontrolled population movement. In the 1990s, Albania experienced political changes, and during this period people frequently moved without registering their addresses. As a result, it must have been difficult for the health agencies to track the vaccination routines of the children born during this period and at least some must have remained unvaccinated. Another explanation is the lack of vaccination during 1989-1992 and the measles vaccination coverage of 66%-95% during 1994-2000 (2). The ratio of male/female during 1994-2000 was 2:1 (201:117). It may not be a strong explanation for this situation, but in some infectious diseases, the role of gender is an important determinant (8). The clinical presentations, the same signs and complaints, were as described in literature (3,4,6,7,9-15). In this study, fever was presented during the emergency room presentations or during the first 24 h in 98.7% of cases. Typically, morbilliform exanthema appeared 3-4 days after the onset of fever and peaked with the appearance of exanthema, which consists of blanching, erythema, macules, and papules that classically begin on the face and then cover all the body (14). In this study, rash was present in 100% of patients. It can appear 3-4 days after fever onset. This data is consistent with our findings, because the time of hospitalization from the time of fever onset was 3.8 days. Koplik spots, which are pathognomonic for measles infection, were detected in 62.3% of patients. They appear on the buccal mucosa opposite the molars and usually last 12-72 hours (10,12,14). Conjunctivitis, as a constant complaint, was detected in 51.6% of patients. The eyes were

infected around the 4th day and progressively reddened over subsequent days. A total of 27 out of 164 (16.5%) patients developed sub-conjunctival haemorrhages. The patients with severe conjunctivitis had photophobia and intense watering of eyes and required treatment by an ophthalmologist. In accordance with previous publications, the main indications for hospitalization were pulmonary involvement and high/continuous fever (4,11,16-19). Lobar or interstitial pneumonia was reported in 24.2% cases. Pneumonitis in measles patients takes two forms: primary by viral measles infection and secondary by bacterial or other viral coinfections. Chest X-ray findings were not specific and included ground glass opacities, consolidation, interlobular septal thickening, and bronchial or bronchiolar wall thickening (11,14,15,19,20). As previously noted, patients with pneumonia often need oxygen therapy in combination with prednisolone use. Because of a lack of microbiological documentation, the proportion of bacterial superinfections may have been overestimated and this explains the use of antibiotics. Hepatitis, another finding in this study, occurred in 84/318 (26.4%) of patients. Hepatitis in measles in adult patients can be explained by direct viral infection or by hypoxemia during pneumonitis. Therefore, hepatitis should be regarded as a usual symptom rather than a complication of measles infection in adults (21). Leukopenia was found in 63.5% of patients. Deep leukopenia less than 1000/mm<sup>3</sup> was detected in only 13 (4%) patients. Lymphopenia is common during the acute stage of measles and lasts for about 1 week (22). Infection with the measles virus induces transient immunosuppression. In classical measles cases, infected lymphocytes detected as a minor population during the incubation period disappeared soon after the onset of rash whereas in the cases of serious illness,

the infected cells persisted longer after the rash (22,23). Platelet counts less than the normal value were detected in 113 (40.15%) cases. Sometimes thrombocytopenia can correlate with measles complications, but there were no haematological complications in this study (24). Four patients were hospitalized in the intensive care unit. All of them requested intensive care support and two of them showed the complication of acute respiratory distress syndrome. Average duration of hospitalization was 5.04 days, and mortality was 0.3% (1/318). Fortunately, mortality rate was low and this can be explained by the non-grave complicated cases and the supportive therapy available. A limitation of our study was that it could not estimate the actual incidence rates of the disease; incidence rates were estimated only for hospitalized patients. Excluding cases of mild measles that did not require hospital care may have led to a slight overestimation of the complication of the incidence. In conclusion, measles still represents a serious public health problem worldwide. The clinical findings of this study of measles in 318 Albanian adults highlight the poor tolerance of people to measles but the absence of severe complications of the disease.

## References

1. O'Connor P, Jankovic D, Muscat M, Ben-Mamou M, Reef S, Papania M, et al. Measles and rubella elimination in the WHO Region for Europe: progress and challenges. *Clin Microbiol Infect Dis* 2017;23:504-10.
2. Bino S, Kakarriqi E, Xibinaku M, Ion-Nedelcu N, Bukli M, Emiroglu N, et al. Measles-rubella mass immunization campaign in Albania, November 2000. *J Infect Dis* 2003;187:S223-9.

3. Fiasca F, Necozone S, Fabiani L, Mastrodomenico M, Mattei A. Measles-Related Hospitalizations in Italy, 2004-2016: The Importance of High Vaccination Coverage. *Ann Glob Health* 2019;85.
4. Ben-Chetrit E, Oster Y, Jarjou'i A, Megged O, Lachish T, Cohen MJ, et al. Measles-related hospitalizations and associated complications in Jerusalem, 2018-2019. *Clin Microbiol Infect* 2020;26:637-42.
5. Paules CI, Marston HD, Fauci AS. Measles in 2019 - Going Backward. *N Engl J Med* 2019;380:2185-7.
6. Lee SH, Kim S, Park SC, Kim MJ. Cytotoxic Activities of *Leptospira interrogans* Hemolysin SphH as a Pore-Forming Protein on Mammalian Cells. *Infect Immun* 2002;70:315-22.
7. Strebel PM, Orenstein WA. Measles. *N Engl J Med* 2019;381:349-57.
8. Puca E, Pipero P, Harxhi A, Abazaj E, Gega A, Puca E, et al. The role of gender in the prevalence of human leptospirosis in Albania. *J Infect Dev Ctries* 2018;12:150-5.
9. Barbosa JR, Martins AS, Ruivo J, Carvalho L. Fever and Rash: Revisiting Measles. *Acta Med Port* 2018;31:341-5.
10. Zenner D, Nacul L. Predictive power of Koplik's spots for the diagnosis of measles. *J Infect Dev Ctries* 2012;6:271-5.
11. Albarello F, Cristofaro M, Rizzi EB, Giancola ML, Nicastrì E, Schininà V. Pulmonary measles disease: old and new imaging tools. *Radiol Med* 2018;123:935-43.
12. Premaratna R, Luke N, Perera H, Gunathilake M, Amarasena P, Chandrasena TGAN. Sporadic cases of adult measles: a research article. *BMC Res Notes* 2017;10:38.
13. Tu B, Zhao JJ, Hu Y, Fu JL, Huang HH, Xie YX, et al. Clinical and immunological analysis of measles patients admitted to a Beijing hospital in 2014 during an outbreak in China. *Epidemiol Infect* 2016;144:2613-20.
14. Leung AK, Hon KL, Leong KF, Sergi CM. Measles: a disease often forgotten but not gone. *Hong Kong Med J* 2018;24:512-20.
15. Suter C, Buergi U, Eigenmann K, Franzen D. Severe acute measles pneumonitis: virus isolation in bronchoalveolar lavage fluid. *BMJ Case Rep* 2015;bcr2015210826.
16. Berti E, Sollai S, Orlandini E, Galli L, De Martino M, Chiappini E. Analysis of measles-related hospitalizations in Tuscany from 2000 to 2014. *Epidemiol Infect* 2016;144:2605-12.
17. Bassetti M, Schenone E, Calzi A, Camera M, Valle L, Ansaldi F, et al. Measles outbreak in adults in Italy. *Infez Med* 2011;19:16-9.
18. Caseris M, Houhou N, Longuet P, Rioux C, Lepeule R, Choquet C, et al. French 2010-2011 measles outbreak in adults: report from a Parisian teaching hospital. *Clin Microbiol Infect* 2014;20:O242-4.
19. Schoini P, Karampitsakos T, Avdikou M, Athanasopoulou A, Tsoukalas G, Tzouveleakis A. Measles pneumonitis. *Adv Respir Med* 2019;87:63-7.
20. Forni AL, Schluger NW, Roberts RB. Severe measles pneumonitis in adults: evaluation of clinical characteristics and therapy with intravenous ribavirin. *Clin Infect Dis* 1994;19:454-62.

21. Dinh A, Fleuret V, Hanslik T. Liver involvement in adults with measles. *Int J Infect Dis* 2013;17:e1243-4.
22. Laksono BM, Grosserichter-Wagener C, de Vries RD, Langeveld SAG, Brem MD, van Dongen JJM, et al. In Vitro Measles Virus Infection of Human Lymphocyte Subsets Demonstrates High Susceptibility and Permissiveness of both Naive and Memory B Cells. *J Virol* 2018;92:e00131-18.
23. Okada H, Kobune F, Sato TA, Kohama T, Takeuchi Y, Abe T, et al. Extensive lymphopenia due to apoptosis of uninfected lymphocytes in acute measles patients. *Arch Virol* 2000;145:905-20.
24. Kumar D, Sabella C. Measles: Back again. *Cleve Clin J Med* 2016;83:340-4.

---

© 2022 Çomo et al; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.