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BACKGROUND
The etiology of bacterial meningitis in Turkey has been changed in the rest of the world after the implementation of conjugated vaccines against Streptococcus pneumoniae and Haemophilus influenzae type b (Hib) in Turkish national immunization schedule. A clear decline was observed in meningitis caused by meningococci and Hib in Turkey according to our previous studies. As it is known to improve the causative microorganisms in bacterial meningitis in deciding the strategy to be followed in prevention and empiric treatment of bacterial meningitis, we have been performing a nationwide hospital-based meningitis surveillance study across several regions of Turkey. Here we present our results from 2015 to 2017.

METHODS
This prospective study was conducted in 25 hospitals located 7 regions of Turkey (representing 30% of Turkey's population) and children aged between 1 month and 18 years with suspected meningitis and hospitalized between 1 January 2015 and 31 December 2017 were included. After written parental/legal guardians consent, cerebrospinal fluid samples were collected and bacterial identification was made according to the multiplex assay results. The study protocol was approved by the ethics committees of the Hacettepe University Institutional Ethics Committee as well as the other sites of local ethics committees.

RESULTS
During the study period 927 children were hospitalized for suspected meningitis and Hib (n=1), S. pneumoniae (n=37) and Neisseria meningitidis (n=59) were detected in 77 samples (Figure 1, Table 1). During 2015-2016, N. meningitidis serogroup W, B, A, Y, X frequencies were at 15.9% (16), 44.4% (1, 2.8%), 1.8% (2.8%) respectively. There were 12 nongroupable N. meningitidis samples and serogroup W wasn’t detected. In 2017, of meningococcal serogroup B, W, A, Y and X were identified in 2 (8.7), 38.9 (2.8), 1 (4.3) and 9 (9.1%) of meningococcal meningitis cases, respectively (Table 1, Figure 2). There were four deaths in this study period, all of them were caused by N. meningitidis serogroup B and three of them were under 1 year old.

CONCLUSION
The epidemiology of meningococcal diseases has been vary in time with or without any apparent reasons. Hajj is a well known cause for seasonal fluctuations of epidemics and serogroup W was the most common cause of meningitis in Turkey during 2009-2014 as well as in other Middle East countries. After the impact of serogroup W epidemics related to Hajj seen in 2010’s was diminished, serogroup B has been the leading cause of childhood meningitis since 2015. In countries affected from Hajj like Turkey, vaccination of children with serogroup B meningococcal vaccine as well as quadrivalent conjugated meningococcal vaccine seems to be very important. It should be kept in mind that meningococcal epidemiology is dynamic and need to be closely monitored to detect changes in years.

Table 1. Distribution of causative agents of bacterial meningitis in Turkey during 2005-2017

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<tr>
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</thead>
<tbody>
<tr>
<td>Neisseria meningitidis</td>
<td>138</td>
<td>56,8</td>
<td>108</td>
<td>40,4</td>
<td>41</td>
<td>62,1</td>
<td>46</td>
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<tr>
<td>Serogroup W</td>
<td>59</td>
<td>42,8</td>
<td>19</td>
<td>17,6</td>
<td>23</td>
<td>56,1</td>
<td>26</td>
</tr>
<tr>
<td>Serogroup B</td>
<td>43</td>
<td>31,2</td>
<td>38</td>
<td>35,2</td>
<td>3</td>
<td>7,3</td>
<td>15</td>
</tr>
<tr>
<td>Serogroup C</td>
<td>1</td>
<td>0,7</td>
<td>9</td>
<td>8,3</td>
<td>15</td>
<td>36,6</td>
<td>3</td>
</tr>
<tr>
<td>Nongroupable</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S. pneumoniae</td>
<td>1</td>
<td>2,2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Total | 243 | 100 | 267 | 100 | 66 | 100 | 69 | 100 | 94 | 100 | 49 | 100 | 28 | 100 |

Figure 1. Distribution of causative agents of bacterial meningitis in Turkey during 2005-2017

Figure 2. Distribution of meningococcal serogroups of meningococcal meningitis during 2015-2017 with results belonging to previous years.

REFERENCES