Summary of adverse events following immunization reported in Switzerland during 2016

Executive summary

During 2016, Swissmedic received 209 case reports of suspected adverse events following immunization (AEFI) from Switzerland. This is a lower level as the number of cases submitted during 2015 (278 reports) and as compared to 2014 (296 reports). However, in 2015, 80 of 278 reports had been retrospectively submitted cases occurring in previous years. Similarly, in 2014, 106 of 296 case-reports had been retrospectively submitted. No such retrospective reporting occurred during 2016 and hence all 209 case-reports contain recently occurring AEFI. Notably, there are no accurate data available regarding the total number of vaccines/doses administered during 2016 and therefore a straightforward conclusion regarding AEFI reporting rates cannot be drawn. As previously, Swissmedic is encouraging spontaneous reporting of AEFIs in high quality, which enables early detection of new safety signals. Since 2010, important safety topics concerning vaccines are being discussed and evaluated by experts of the Swissmedic Human Medicines Expert Committee (HMEC). An increased AEFI reporting rate followed by a scientific evaluation of relevant cases can lead to risk minimisation measures in order to ensure vaccines safety, if necessary.

Figure 1. Number of AEFI reports per age group and gender, 2016

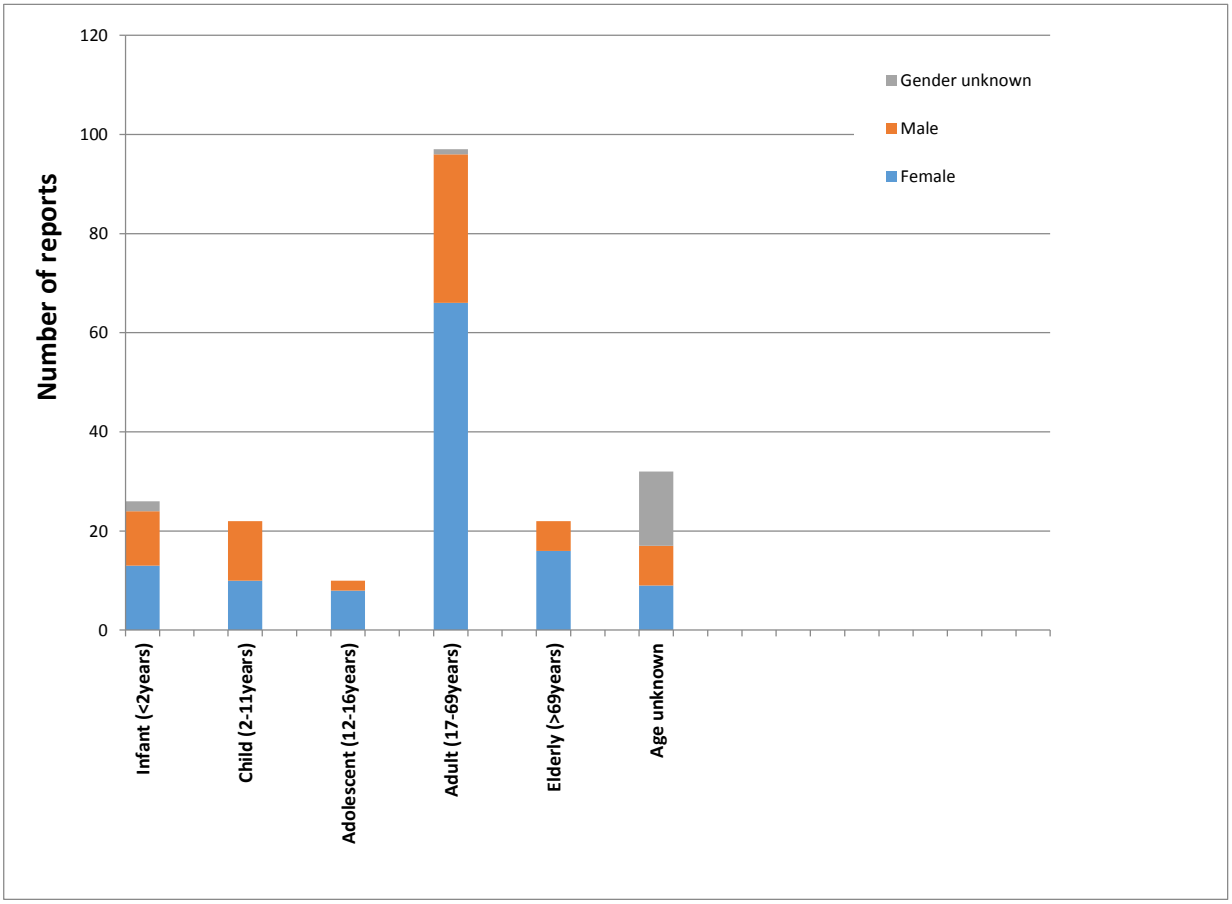

Figure 1 compares the number of reports per age group and gender. The largest number of AEFI reports involved adults (97 reports), followed by infants (26 reports), elderly (22 reports) and children (22 reports). Throughout the year, the number of reports concerning females (122 reports) was significantly higher than the number of reports regarding males (69 reports). In 18 AEFI reports, the gender of the persons remained unknown. A higher difference in gender is apparent in the groups 'adults' (66 reports of females vs. 30 males) and 'elderly' (16 reports of females vs. 6 males). In 32 case-reports, the age of the patients was not recorded.

Figure 2. Number of reports per vaccine group (ATC code) and seriousness, 2016

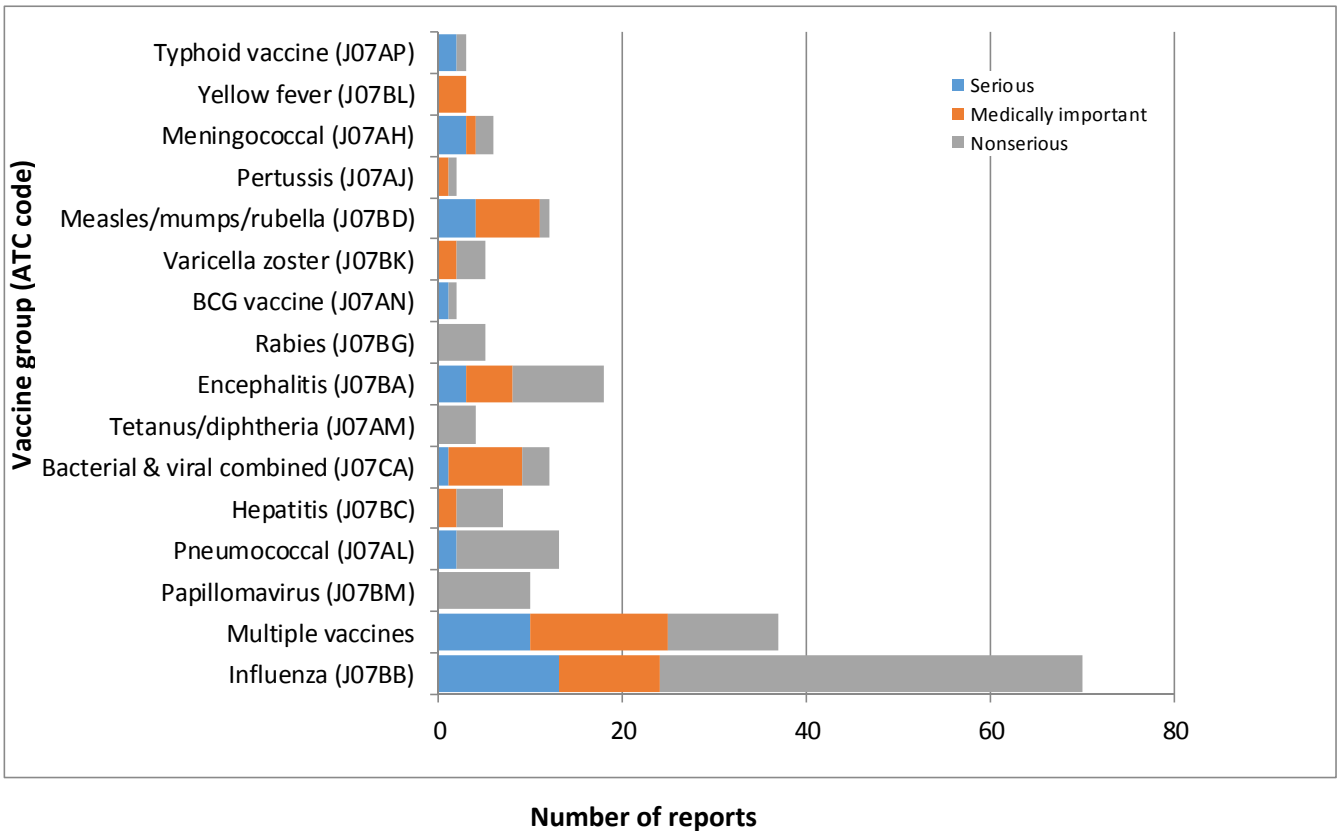

Figure 2 shows the number of spontaneous AEFI reports grouped per vaccine group (ATC code) and seriousness. There are no data available regarding the number of doses administered in each particular vaccine group and therefore this figure does not indicate which vaccine group displayed a higher AEFI rate (as number per 100'000 doses). Generally, a safety report is assessed as 'serious' if it involves an adverse event leading to death, to hospitalisation or to prolongation of an existing hospitalisation, if it was life threatening or resulted in a significant or persistent disability or a congenital anomaly. Additionally, a report is assessed as 'medically important' (and therefore serious) if it does not fulfil the criteria for 'seriousness' mentioned but it involves an event considered to be significant by medical judgement. All other reports are assessed as 'not serious' (e.g. self-limiting adverse events with good recovering). Of the 209 spontaneous reports received in 2016, 115 (55%) were not-serious, 55 (26.3%) included medically important events and 39 (18.7%) of the reports involved AEFIs with serious consequences. The relative frequency (percentage) of 'not serious' reports (i.e. without serious consequences) was higher as compared to those recorded during the previous year (55% in 2016 vs. 49.5% in 2015).

Figure 3. Number of AEFI reports per reporter qualification and seriousness, 2016

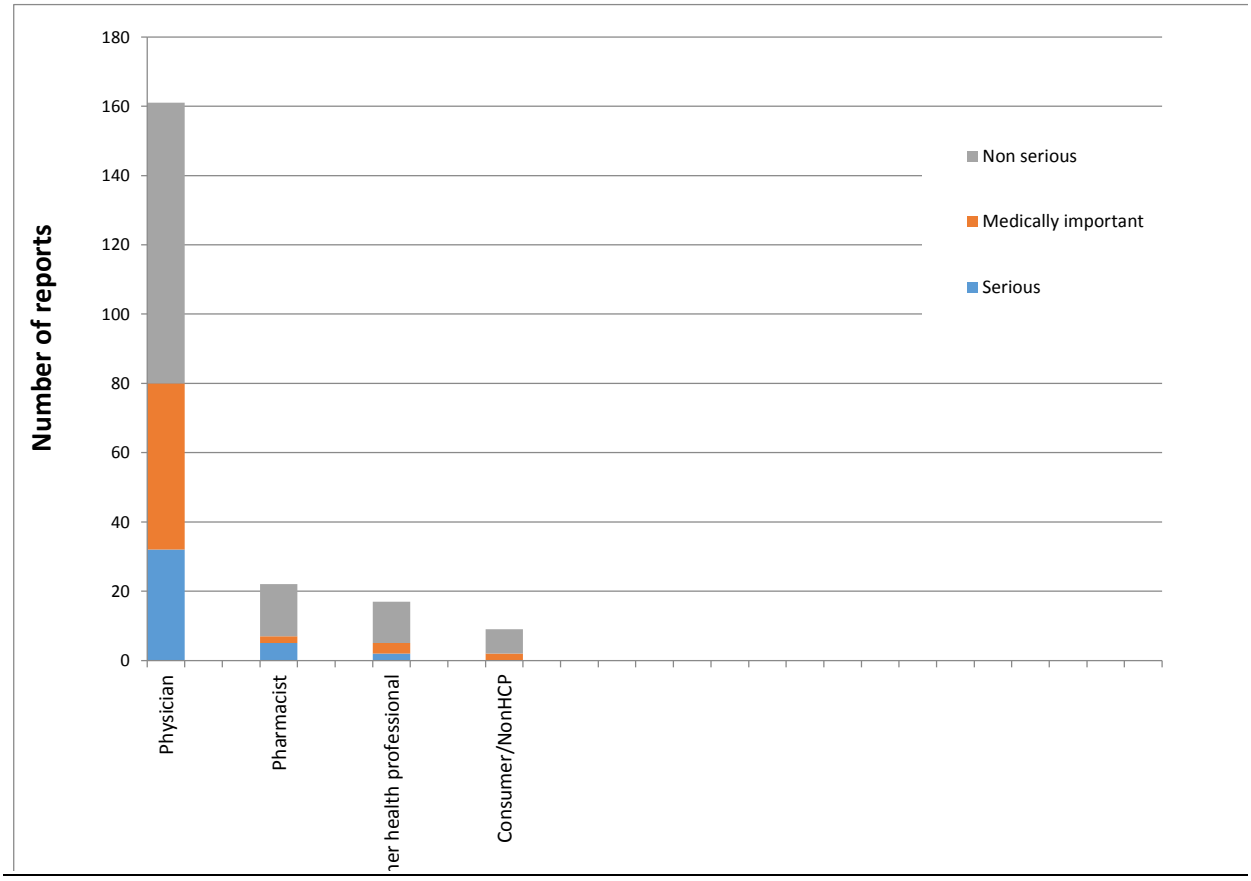

Figure 3 shows the number of Swiss AEFI reports in 2016 grouped by primary reporter and seriousness. Health care professionals, mostly providing medically confirmed data and good quality of individual AEFI reports, primarily reported the vast majority of cases. Physicians reported the largest group of AEFI cases (161 of 209), including also a higher number of reports assessed as serious or medically important (80 of 161 reports).

Figure 4. Number of AEFI reports per age group and seriousness, 2016

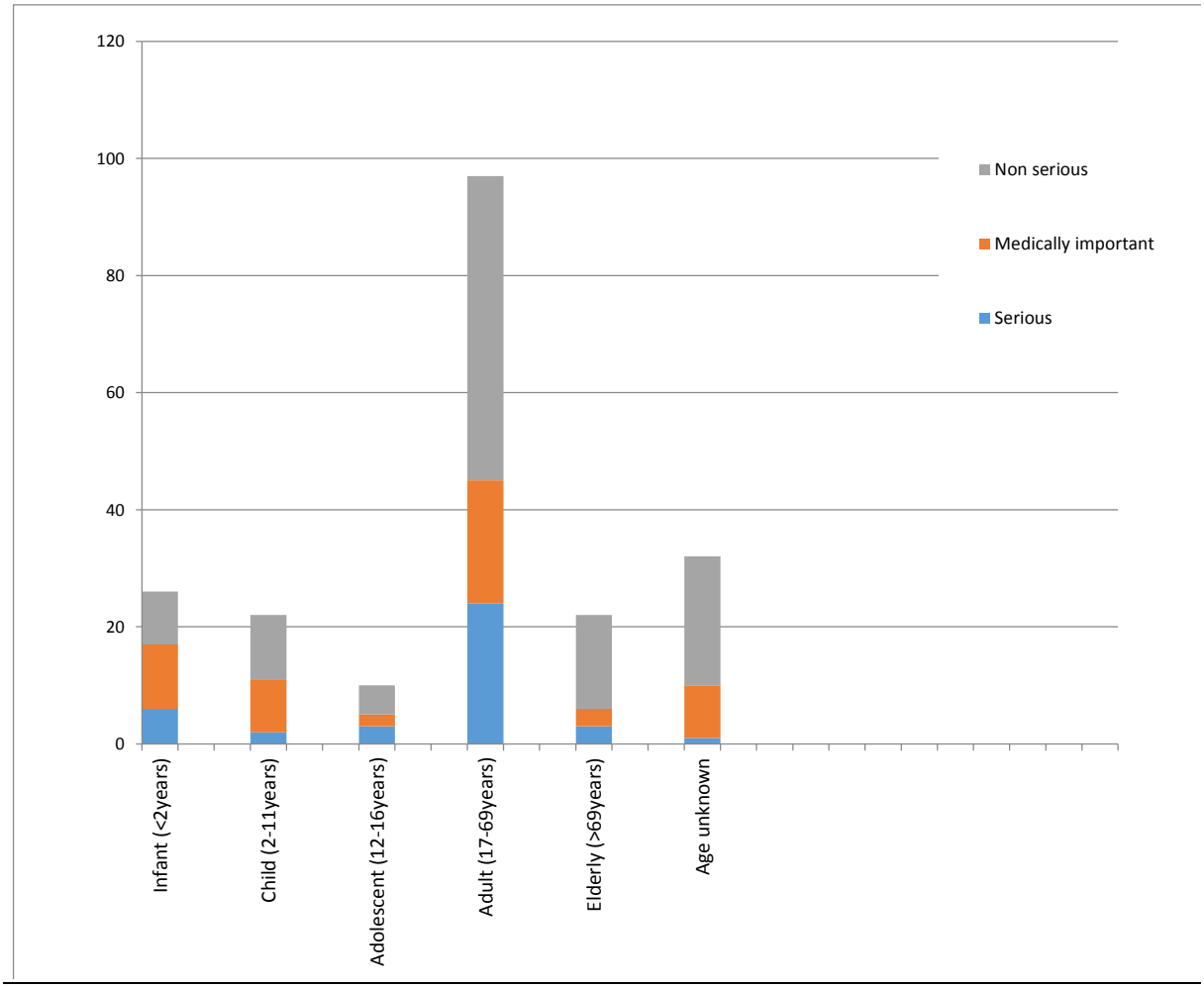

Figure 4 shows the number of spontaneous AEFI reports grouped by age group and seriousness. It becomes apparent that the highest numbers of 'serious' (24 reports) or 'medically important' (21 reports) have been recorded in the age group 'adults'. During 2016, the age group 'elderly' totalises the lowest percentage of 'serious' or 'medically important' cases taken together (6 of 22 reports, 27.2%) as compared with the other age groups analysed: adults (45 of 97 reports, 46.4 %), children (11 of 22 reports, 50%); adolescents (5 of 10 reports, 50%) and infants (17 of 26 reports, 65.4%).

Figure 5 provides an overview on the AEFI reports received during 2016, as grouped by the MedDRA System Organ Classes (SOCs) concerned, i.e. regarding AEFI of each report. The following five organ classes were most frequently involved in reports after immunization: General disorders and administration site conditions (100 reports, 47.8%); Injury, poisoning and procedural complications (72 reports, 34.4%); Nervous system disorders (48 reports, 23%); Skin and subcutaneous tissue disorders (32 reports, 15.3%); Musculoskeletal and connective tissue disorders (28 reports, 13.4%).

Figure 5. Number of AEFI reports in Switzerland by System Organ Classes, 2016

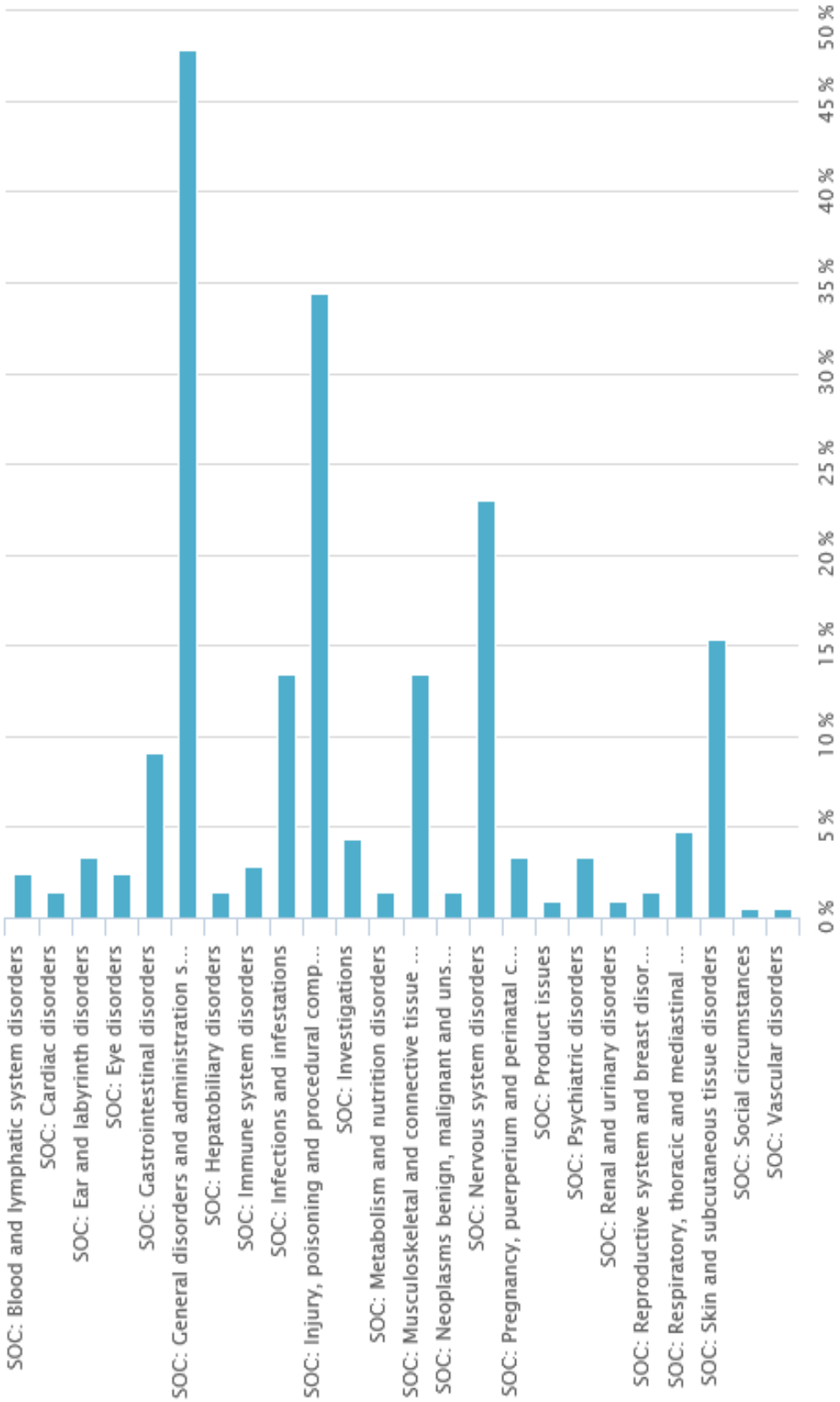

Figure 6. AEFI reports by vaccine group (ATC code) and top 3 involved System Organ Classes, 2016

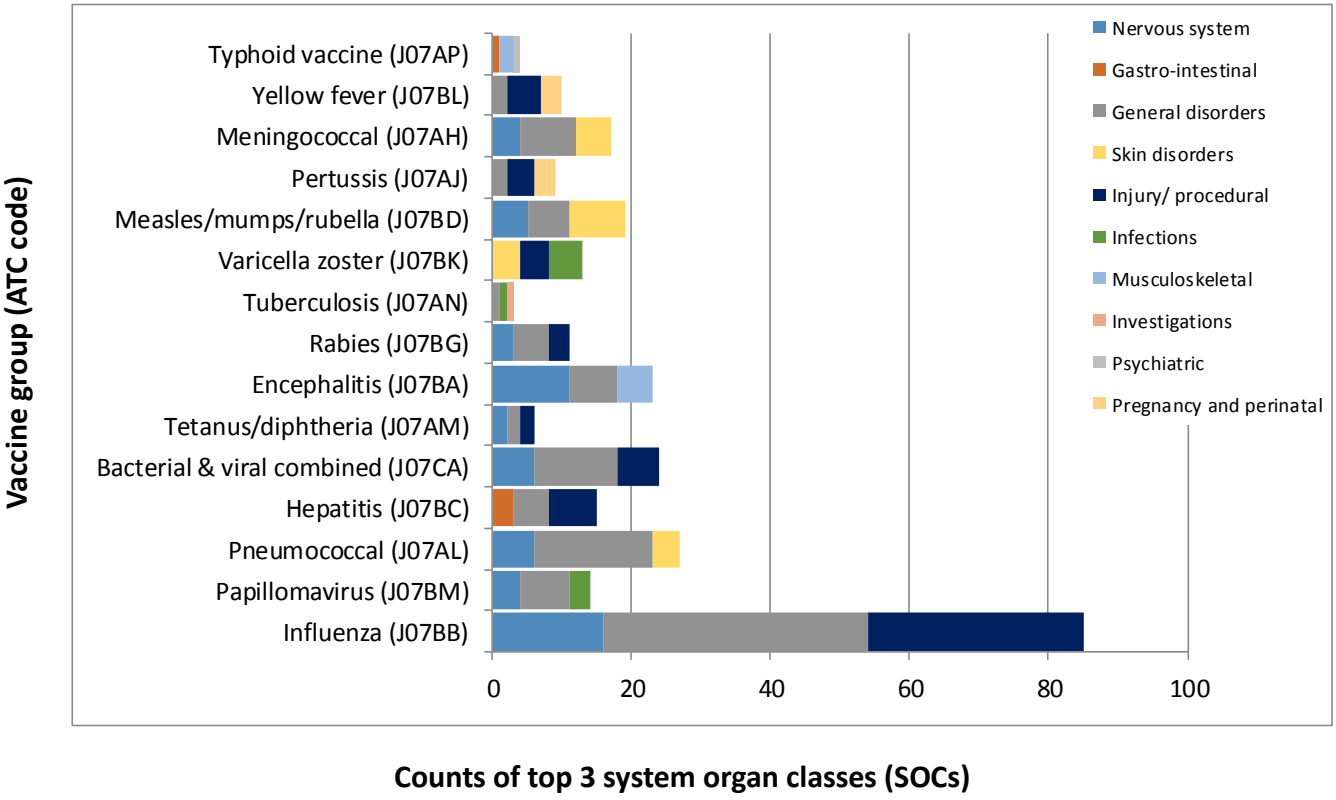

Figure 6 shows the AEFI reports by vaccine group (ATC code) and top 3 MedDRA system organ classes concerned. Notably, most of the vaccines have a significant part of their frequently reported adverse events classified in the SOCs: General disorders and administration site conditions; Musculoskeletal and connective tissue disorders; Skin and subcutaneous tissue disorders; Injury, poisoning and procedural complications.

Table 1. Overview on the most frequent AEFIs of all reports, 2016

Adverse event	System Organ Class	Number of reports
Injection site reactions	General disorders and administration site conditions	71
Fever	General disorders and administration site conditions	27
Erythema/ Rash/ Urticaria	Skin and subcutaneous tissue disorders	24
Incorrect product storage	Injury, poisoning and procedural complications	24
Exposure during pregnancy	Injury, poisoning and procedural complications	20
Headache	Nervous system disorders	16
Nausea/ Vomiting	Gastrointestinal disorders	14
Vaccination failure	Injury, poisoning and procedural complications	11
Asthenia/Fatigue	General disorders and administration site conditions	9
Arthralgia	Musculoskeletal and connective tissue disorders	7
Myalgia	Musculoskeletal and connective tissue disorders	7

Table 1 displays the most frequent AEFI as reported during 2016: injection site reactions; fever; erythema/ rash/ urticaria; incorrect product (vaccine) storage; exposure during pregnancy; headache; nausea/ vomiting; vaccination failure; asthenia/ fatigue; arthralgia; myalgia.

Table 2. The most frequent AEFIs in 'serious' or 'medically important' reports, 2016

Adverse event	System Organ Class	Number of reports
Injection site reactions	General disorders and administration site conditions	22
Fever	General disorders and administration site conditions	15
Exposure during pregnancy	Injury, poisoning and procedural complications	15
Erythema/ Rash/ Urticaria	Skin and subcutaneous tissue disorders	13
Vaccination failure	Injury, poisoning and procedural complications	10
Headache	Nervous system disorders	9
Asthenia/ Fatigue	General disorders and administration site conditions	7
Arthralgia	Musculoskeletal and connective tissue disorders	5
Nausea/ Vomiting	Gastrointestinal disorders	5

Table 2 summarizes the most frequent AEFIs in reports assessed as 'serious' or 'medically important'. The two tables (Table 1 and Table 2) are displaying similar distributions of reported AEFIs. New AEFI appearing in these two tables as compared with previous year 2015 are: 'incorrect product storage' - a procedural error leading to 24 'non-serious' reports; 'exposure during pregnancy' - leading to 20 reports of which 15 were assessed as 'serious'; 'vaccination failure' - reported in 11 cases of which 10 were 'serious'.

Medically confirmed neurological AEFIs reported during 2016 included:

- Three cases of 'hypotonic-hyporesponsive episode': one case in a 5-month-old male infant following the administration of several different vaccines: tetanus vaccine/ diphtheria vaccine/ hepatitis b vaccine/ pertussis vaccine/ polio vaccine/ haemophilus influenza type B vaccine and pneumococcal vaccine, with outcome 'recovered'. The second case occurred in a 4-month-old female infant, also following the administration of several different vaccines: tetanus vaccine /diphtheria vaccine/ hepatitis b vaccine/ pertussis vaccine/ polio vaccine/ haemophilus influenza type B vaccine and pneumococcal vaccine, with outcome also 'recovered'. The third case occurred in a 13-month-old female infant, also following the administration of several different vaccines: measles vaccine/ mumps vaccine/ rubella vaccine and pneumococcal vaccine. The outcome was also 'recovered'.

- One case of a 'neuromyelitis optica spectrum disorder' in a 44-year-old female, following the administration of several different vaccines: diphtheria vaccine/ pertussis vaccine/ polio vaccine/ tetanus vaccine and rabies vaccine, with outcome 'not recovered' at the time of reporting.

- One case of ‘noninfectious myelitis’ in a 33-year-old male, following the administration of tick-borne encephalitis vaccine, with outcome ‘not recovered’.

- One case-report of ‘narcolepsy’ in a 41-year-old female, following the administration of influenza vaccine, with outcome ‘not recovered’.

- One case of ‘Guillain-Barré syndrome’ in an elderly male patient (exact age not reported), following the administration of tick-borne encephalitis vaccine, with outcome reported as ‘unknown’.

- Three cases of ‘facial paresis’: one case in a 13-year-old female, following the administration of several different vaccines: diphtheria vaccine/ pertussis vaccine/ tetanus vaccine and HPV vaccine, with outcome ‘recovered’. The second case occurred in a 80-year-old male, following influenza vaccination, with outcome ‘recovering’ at the time of reporting. The third case occurred in a 13-month-old male following the administration of several different vaccines: measles vaccine/ mumps vaccine/ rubella vaccine and pneumococcal vaccine, with outcome ‘recovered’.

- One case of ‘paraparesis’ in a 12-year-old female, following administration of hepatitis b vaccine and HPV vaccine, with outcome reported as ‘recovering’.

- One case of ‘hemiparesis’ in a 6-year-old female, following administration of several vaccines: diphtheria vaccine/ pertussis vaccine/ tetanus vaccine and tick-borne encephalitis vaccine, with outcome ‘recovering’.

- Two cases of ‘syncope’: one case in a 33-year-old male after influenza vaccination (outcome ‘recovered’); the second case in a 6-year-old male following tick-borne encephalitis vaccination (outcome also ‘recovered’);

Swissmedic received no fatal AEFI-reports during 2016.