# Measurement of temperature excursions in different medication storage compartments during a mass casualty incident

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**Introduction:**
When a Mass Casualty Incident (MCI) or a disaster strikes, medication used on the scene is likely to be exposed to temperature excursions and variations. During MCIs/disasters pharmaceuticals are often not stored as recommended by the manufacturer. This could result into a decreased stability of pharmaceuticals used on the scene and may result in treatment failure, especially when hazardous temperature excursions occur >30°C and >40°C.

**Aims/objectives:**
The main objective was to measure the magnitude of temperature excursions in medication storage compartments, how long they last and how often they occur during MCIs in Belgium.

**Materials/Methods:**
This observational study was conducted in Belgium from December 2020 till August 2021. Measurements were done in 3 different simulation settings where medication is potentially stored at the time of an MCI: in an Advanced Medical Post (AMP), in the outdoor setting and in a fast car. In total, 17 probes were used to measure temperatures in 3 medication storage compartments (metal, plastic, Emergency Medical Service or EMS bag). Definition of a significant temperature excursion is defined as a cumulative time above or below a certain cut-off of more than 24 hours per week.

**Results:**
Temperatures <0°C occurred for each AMP-compartment during summer and winter. For the EMS medication bag inside the AMP, significant excursions >25°C occurred for >50% of the time in June. Excursions in the different medication compartments in the outdoor setting occurred at the same time as inside the AMP. During the whole study period, significant temperature excursions >25°C follow each other in the outdoor setting. This is also the case for excursions > 30°C (less pronounced). The fast car encountered significant excursions >25°C for >90% of the study period. One significant excursion above 30°C occurred during one week of June.

**Conclusion:**
For every simulation setting and every compartment, excursions <0°C or >25°C, 30°C or even 40°C are significant (>24 hours/week). When medication is stored in the field, hazardous temperature excursions occur which could lead to an altered pharmaceutical stability and thus to therapy failure. Further pharmaceutical stability studies are necessary to prove this, especially of time and temperature sensitive pharmaceutical products (TTSPPs).