Human pharmaceutical substances – identification of data gaps for environmental risk assessment (ERA)

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Summary

- ERA data are missing for 281 substances currently available on the German market.
- The substance groups with the highest number of active ingredients on the market and missing ERA data are endocrine active substances and neuroactives followed by antibiotics.
- 77 substances with high predicted environmental concentrations (PEC_{market} ≥ 0.1 µg/L) do not have full ERA data sets.
- 50 substances were found in European surface waters in concentrations exceeding the PEC action limit 10 times and higher, without available information on the environmental toxicity.
- There is a large data gap for substances with specific toxicity profiles.

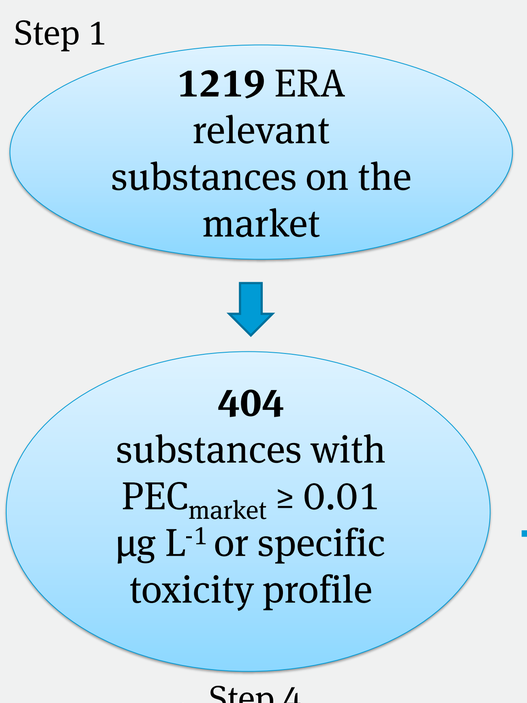
Identifying data gaps in environmental risk assessment

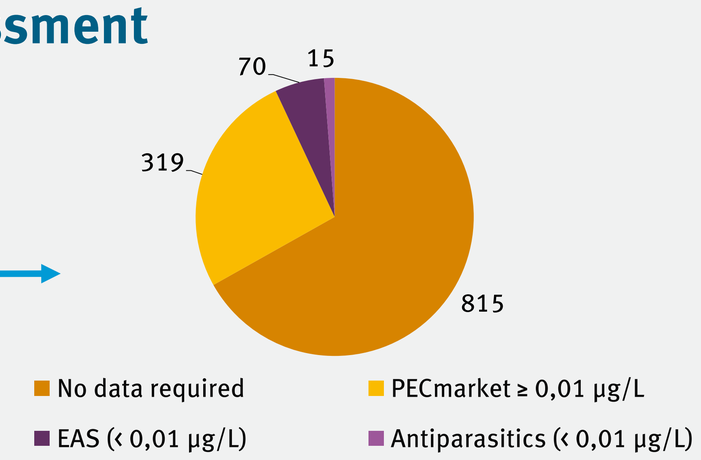
Step 1: identifying active substances on the German market relevant for a Phase I – risk assessment in accordance with the exemptions given in the current guideline : *„.... products containing vitamins, electrolytes, amino acids, peptides, proteins, carbohydrates and lipids as active pharmaceutical ingredient(s),...due to their nature they are unlikely to result in a significant risk to the environment. The same applies to vaccines and herbal medicinal products."*

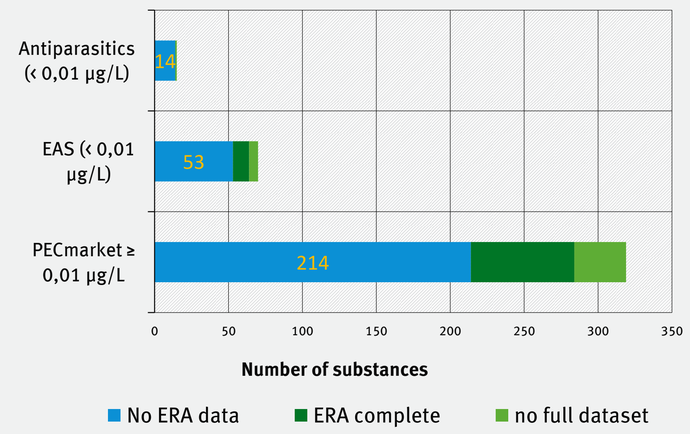
Step 2: selecting substances which need a Phase II risk assessment in accordance to the EMA guideline by considering PEC_{market} (see supplementary information)

Step 3: comparing the Phase II substances with available ERA data (until 12 /2021), identifying substances without ERA

Step 4: further analysis

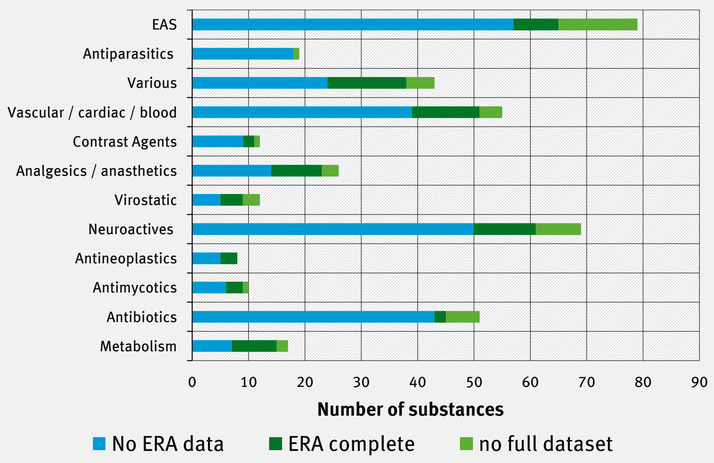






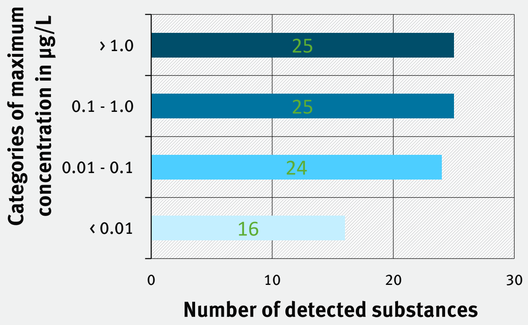
Are there specific substance groups with large data gaps?

For definition of the groups please see the supplementary information.

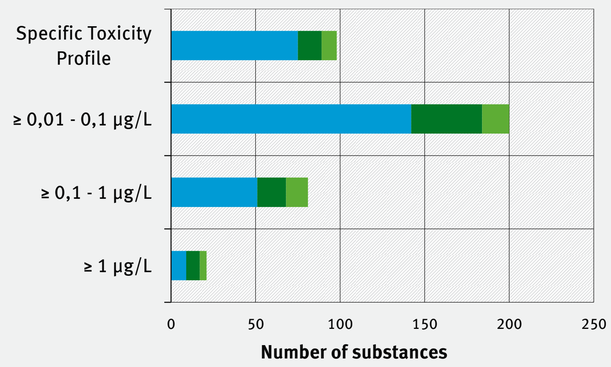


Substances without ERA data detected in European surface waters

Monitoring data based on the UBA Pharma Database [1]



How many data sets are available for substances with high PEC_{market}?



Conclusions:

- A catching-up procedure for active substances without ERA studies is urgently needed
- In a first step, data should focus on
  - Assessment of substances with high PEC_{market} and detected in the environment (see tables in supplement)
  - targeted assessment for substances with specific toxicity profiles
- Further on data should be generated for substances with high PECmarket or for specific substance groups

Background

Since 2006, the assessment of environmental risks of human pharmaceuticals has been conducted in accordance with the respective EMA guideline [3] in marketing authorization applications. Exemptions exist for products were no increase of environmental exposure of the active substance is expected. However, some of these substances are used in high amounts and detected in the environment. ERA data are not available but needed for the derivation of EQS or other limit values. The intention of this analysis is to give an overview for how many active ingredients, currently available in relevant amounts on the German market, data for an environmental risk assessment are missing. The evaluation is based on ERA data from authorization procedures of human medicinal products, predicted environmental concentrations using consumption data for Germany (PEC_{market}) [2] and European environmental monitoring data [1].

References:
1) UBA Pharma database: www.uba.de/db-pharm
2) IQVIA(2022): IQVIA MIDAS, 2020
3) EMEA/CHMP/SWP/4447/00 corr 2, Guideline on the environmental risk assessment of medicinal products for human use, 2006

For information on data gaps of veterinary pharmaceutical substances please visit poster 8368.

German Environment Agency

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