

Early Childhood Resistome Development

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1 INTRODUCTION

- **Antimicrobial resistance** represents public health threat.
- It is affecting the **treatment of bacterial infections** in both humans and animals worldwide¹.
- The drug resistant bacteria have impact on people of all ages, however, the **increasing trend** in antimicrobial resistant microorganisms **in infants** has gone relatively **unexplored**.

2 RESISTOME

- The **resistome** is a collection of all **antimicrobial resistance genes (ARGs)** in both pathogenic and non-pathogenic bacteria².
- The structure of human resistome is completely **individual**.
- **Various factors** are involved in the formation of the resistome³ (Fig1).
- Scientists are suggesting that **ARGs are becoming part of a human microbiome even before his or her birth in utero**⁴.

3 STUDY DESIGN

- This project is a part of **CELSPAC-TNG** cohort study (Central European Longitudinal Studies of Parents and Children: The Next Generation).
- Samples from **children** (meconium/stool, buccal swabs) will be collected after the childbirth, during the 5th, 17th and 24th week of child's life.
- Samples from **mothers** (stool, buccal swabs) and **environment** (dust) will be studied as potential reservoirs of ARGs for children.
- The resistome will be analysed using **whole metagenome shotgun (WMGS) sequencing, high-throughput qPCR (HT-qPCR)** and **cultivation techniques**.

4 OBJECTIVES

Answer the following questions:

? Are **children in the Czech Republic born with ARGs** in their oral or gut microbiome?

? What is the **prevalence** of ARGs in meconium, stool and buccal mucosa of infants?

? Are there any **differences in the structure** of infant's resistome during **different timepoints** of infant's life?

? What is the **prevalence** of ARGs in mothers, households and hospitals serving as potential **ARGs sources** for children?

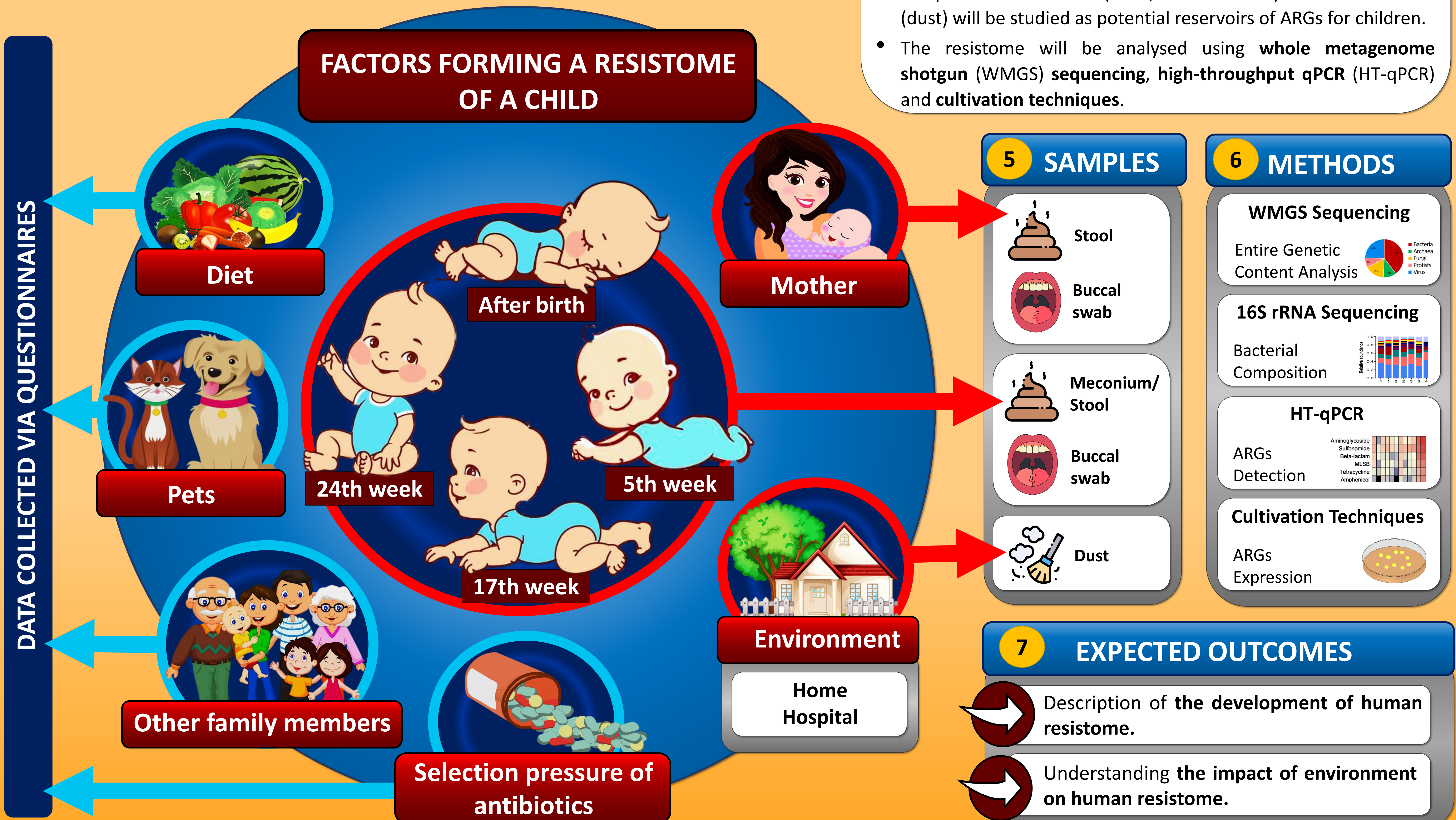


Fig1. Factors forming a resistome of a child.

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