9-Month Assessment Report

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Declaration

I declare that this document and the accompanying code has been composed by myself, and describes my own work, unless otherwise acknowledged in the text. It has not been accepted in any previous application for a degree. All verbatim extracts have been distinguished by quotation marks, and all sources of information have been specifically acknowledged.

Signed:

Date: 2015

Abstract

What is this shizz about?!?!

Acknowledgements

Thank god for tea!

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Chapter 1: Introduction

This chapter introduces the 9 month report, presents the research questions and gives a quick overview of some of the background and motivations of the PhD.

1.1 Introduction

Firstly I would like to mention that I only started the PhD in early December but I wish to submit my 9 month report with the rest of the students in order to present at the symposium with everyone else, instead of having to wait longer or have a separate one.

I do believe that my progress so far is enough to justify a good 9 month progress report. I am also confident enough to be able to present at the symposium.

The main purpose of this PhD is to answer questions the medical health departments have from an efficient computing and mathematical point of view. This will be the novel approach to questions they have.

1.2 Background

My primary supervisor, Dr Steve Turner has been working on the relationship between antenatal measurement and postnatal outcomes and has shown that certain types of growth inside the womb lead to an increased chance of the baby having asthma when it grows up [1].

Other researchers from around the world [] have also shown similar relationships with other outcomes. Given such research, Dr Turner would like to find any type of link between antenatal factors and postnatal diseases or disorders like ADHD, diabetes, epilepsy and adult asthma.

1.3 Research Questions

The main research question that needs to be answered is this:

What is the relationship between fetal and maternal characteristics to non-communicable diseases in children and adults?

Sub questions:

Are IVF babies small or do IVF mums produce small babies? IVF vs Spontaneous from same mother

If they are born small, do they catch up? IVF +StonesâĂŃ

If they are born small, at what point do they become small? All datasets

How accurate is gestational assessment?

Chapter 2: Literature Review

This chapter covers some of the current work which inspires my project, some topics related to the research questions and some of the methods I believe will help solve the questions.

2.1 Growth vs Asthma

It has been statistically proven than reduced fetal size from the first trimester is associated with increased risk for asthma and obstructed lung function in childhood [1]. It was proven using a longitudinal study / statistical analysis on around 1k subjects.

The methods used are simple statistical analytics, with confidence intervals to indicate how valid the tests are.

The problem with statistical models is that regardless of the confidence level, they are wrong. We just need to find one that is the least wrong.

2.2 European Thesis

2.3 Imputation and Clustering

Imputation is the process of replacing missing fields with some values. There is a huge array of imputation techniques ranging from not very clever default value imputation, semi-clever mean value imputation or super clever imputation by equations.

Chapter 3: Key Issues

3.1 Missingness

3.2 Clustering and Cluster Validation

3.3 Growth Trajectories

Chapter 4: Transferable Skills

4.1 Presentation Skills

4.2 Approvals and training

Chapter 5: Progress

5.1 Italian Partners

5.2 ACERO Symposium

5.3 FARR International

5.4 FARR PhD

Chapter 6: Future Plans

Chapter 7: Conclusion

Bibliography

[1] Steve Turner. First- and second-trimester fetal size and asthma outcomes at age 10 years, 2011.