INTRODUCTION
1. INTRODUCTION

1.1. Tuberculosis: a public health problem

Tuberculosis remains a major public health problem with an annual burden of 9.0 million new cases and 1.5 million tuberculosis deaths globally.\(^1\) Amongst these cases, India accounts for 2.2 million new cases with an incidence of 171 (95% CI = 162 – 184) per 100 000 population.\(^2\) In 2013, the WHO estimated the prevalence of tuberculosis in India as 211 (95% CI = 170 – 257) per 100 000 population which would translate into 2.8 million individuals affected with tuberculosis at any given point of time in the country.\(^2\) The tuberculosis mortality rate in India in 2013 was estimated to be 19 (95% CI = 12 – 28) per 100 000 population.\(^1\) In spite of a 42 % reduction in the mortality since 1990, there were 0.24 million tuberculosis deaths in India in 2013.\(^2\) With this significant case burden, India ranks first amongst the HBCs enlisted by the WHO.\(^1\) Thus, controlling tuberculosis is one of the major public health priorities in India.

1.2. Tuberculosis in women

Amongst infectious diseases, tuberculosis remains a major cause of mortality among women in the reproductive years. According to the World Health Organization Report on Women’s Health Agenda, tuberculosis contributed to 7.3% and 5.6% of total deaths in the low and middle income countries respectively.\(^28\) Studies conducted in India too reported a greater proportion of deaths caused by tuberculosis than maternal conditions, among women in the reproductive ages.\(^29,30\)

Several studies conducted in the developed countries towards the early twentieth century reported that the peak tuberculosis mortality among women was in a lower age group than men in comparative ages.\(^11–15\) This data has not been pursued in developing country studies, and there is a paucity of age and sex distributed mortality data in developing countries including India. Data from prevalence studies conducted over time and in various regions of India, however, show an increased prevalence of tuberculosis in the younger age groups among women than men.\(^31–35\) These studies include the first country wide tuberculosis prevalence survey conducted by the Indian Council of Medical Research (ICMR) in 1955, where the prevalence of tuberculosis was more in women aged between 15 and 24 years as compared to men in equivalent age groups.\(^31\) Similar observations were noted in studies reported till the 1980s in various areas in the country \(^32–34\) and sporadic reports of excess prevalence of tuberculosis amongst young
women from the lower socio-economic strata from a few Indian studies.\textsuperscript{36–39} Data reported by the Revised National Tuberculosis Control Programme (RNTCP, usually accessed by patients from the lower socioeconomic strata) revealed that the prevalence of tuberculosis amongst women was highest between 25 and 34 years, exceeding that of men in the same age group (29.3\% and 18.9\% respectively).\textsuperscript{40} Other studies conducted after the 1980’s have however not reported this difference.\textsuperscript{38,41–44}

Gender specific risk factors for tuberculosis and other diseases suggest the existence of socio cultural barriers that limit access to care in women than men in developing countries.\textsuperscript{16–21,45,46} Access to treatment is frequently delayed due to multiple step decision making process\textsuperscript{17} and the choice of sub optimally qualified health care providers.\textsuperscript{18} Studies conducted across various low and lower middle income countries including India suggest an underplay of social stigma and tuberculosis in women,\textsuperscript{17,21,47,48} which have not been investigated through traditional epidemiological studies.

\section*{1.3. Research gap and study rationale}
Despite data from developed countries,\textsuperscript{11–15} there are no studies that have investigated whether there is an increased mortality risk among young Indian women tuberculosis patients. Only a limited number of studies have examined the gender differentials of risk factors of tuberculosis mortality.\textsuperscript{21}

\section*{1.4. Aims and Objectives}
Thus the aim of the study was to determine the survival and risk factors for mortality in women patients who had been on Directly Observed Treatment, short course (DOTS) at various tuberculosis treatment centres in Pune city, India.

The objectives of the study are:

1. To determine the survival probabilities of pulmonary tuberculosis patients who were on DOTS eighteen months after initiation of treatment.
2. To determine whether there is a gender based difference in the survival probability of pulmonary tuberculosis patients who have been on DOTS eighteen months after initiation of treatment.
3. To determine the risk factors for mortality in women patients who were on DOTS