ECONOMICS OF NON-ADHERENCE AND IMPACT OF ADHERENCE IN TUBERCULOSIS

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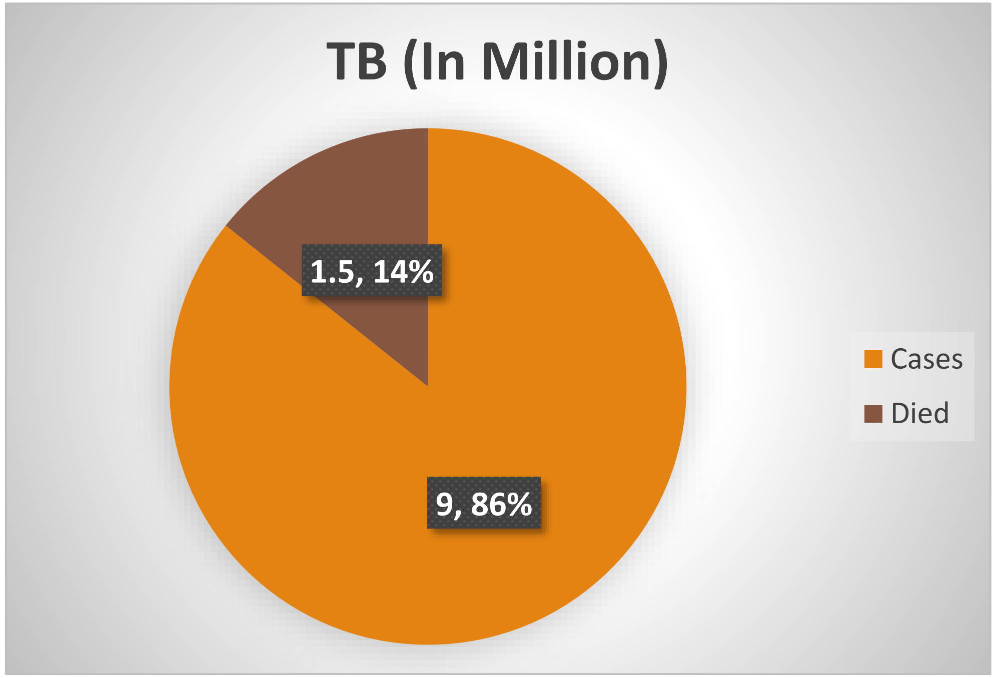
TB

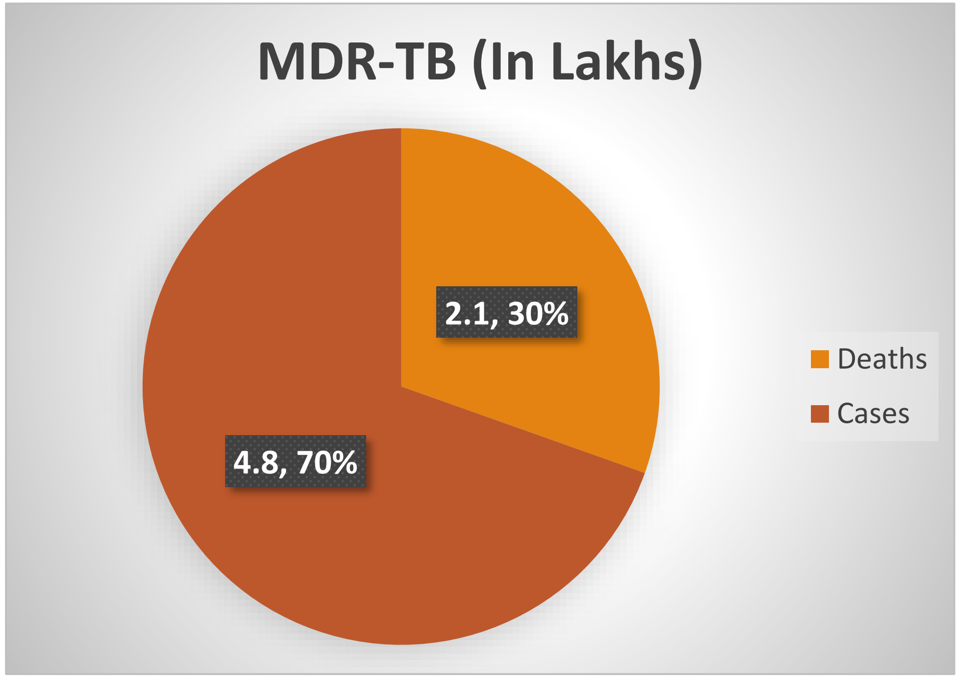
A GLOBAL BURDEN

INTRODUCTION

Second leading cause of death from infectious diseases in world

With highest burden of disease, India remains on top in countries with MDR-TB





Estimated **9 million** cases of TB and **1.5 million** people **died** of TB from worldwide, in 2013.

There were around **2,10,000 deaths** from MDR-TB as compared to **4,80,000 incident cases** of MDR-TB

FACTORS AFFECTING ADHERENCE

- Low literacy level
- Side effects
- Financial reasons
- Complex regimen
- Multiple dosage
- Forgetfulness
- Lack of awareness about the disease
- Barriers to access to care
- Inadequate follow-ups
- Missed appointments
- Lack of trust in physician

CASE EXAMPLE

- Patient diagnosed with open pulmonary TB, failed to continue the course after discharge from the hospital and completed only 2 months of TB course
- He misconceived his wellness as a cured disease and didn't complete the full course of prescribed medication
- This eventually turned into Pott's disease (tuberculous spondylitis) and he was hospitalised for treatment of the same but again he failed to follow-up and discontinued the treatment
- The patient was finally admitted into the acute care infectious disease hospital and was declared too sick for any rehabilitation activity

Medication Adherence and Healthcare Costs

Poor Medication Adherence

Poor health Outcomes

Increased Service Utilization

Increased healthcare costs

Costs passed on to patient

METHODOLOGY

RESEARCH QUESTIONS

01

To explore the reasons for non-adherence in TB patients and to analyse the economic burden caused by non-adherence.

02

How tech solutions can impact the adherence rates

RESEARCH DESIGN

- Secondary research conducted on articles/studies describing the reasons for non-adherence in TB patients
- Descriptive study
- Conducted for three months period from February 2018 to May 2018.
- PICOS– a structured format used to frame and answer the health care related questions P- population, I- intervention, C- comparators, O- outcomes, S- study design

PICOS for TB

Population	Intervention	Comparators	Outcomes	Study Design
Individuals suffering from TB and MDR-TB	CAREDOSE Dispenser-Tech solution	DOTS therapy and conventional hospital treatment	Adherence Decreased Financial Cost Decreased Disease Burden	Systematic Reviews Retrospective analysis of prescriptions of patients and articles

RESEARCH PROCEDURE ADAPTED

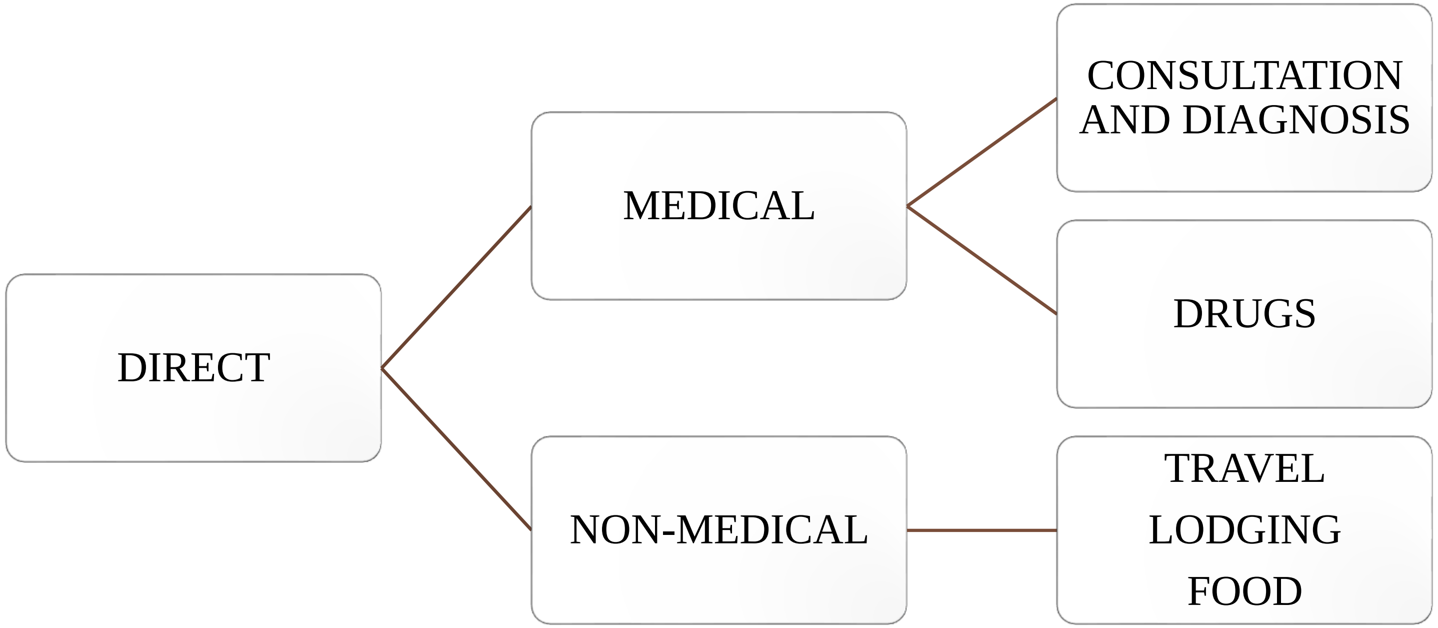
- 142 prescriptions of TB positive patients were reviewed from five private hospitals of Delhi of 5 months period from December 2017 to May 2018

- The trend of non-adherence was analysed by reviewing the following heads of prescriptions:
  - Date of diagnosis
  - Start date of treatment
  - Follow-up dates
  - Tenure of prescription
  - Progression of disease
  - Complications, if any

- Reasons and dimensions of non-adherence were reviewed from articles already published
- Comparison of cost of non-adherence with adherence cost and CAREDOSE services
- **SAMPLE SIZE** – 142 patients
- **STUDY SETTING:** The study was carried out in CAREDOSE, a Med-Tech start-up, Mohan estate, Delhi
- **INCLUSION CRITERIA:** Data for patients with positive sputum results for pulmonary tuberculosis and patients with MDR-TB in 5 months period from December 2017 to April 2018 was analysed in the study
- **DATA ANALYSIS PROCEDURE:** The data was collected and analysed in the MS excel sheets using functions and formulas

FINDINGS

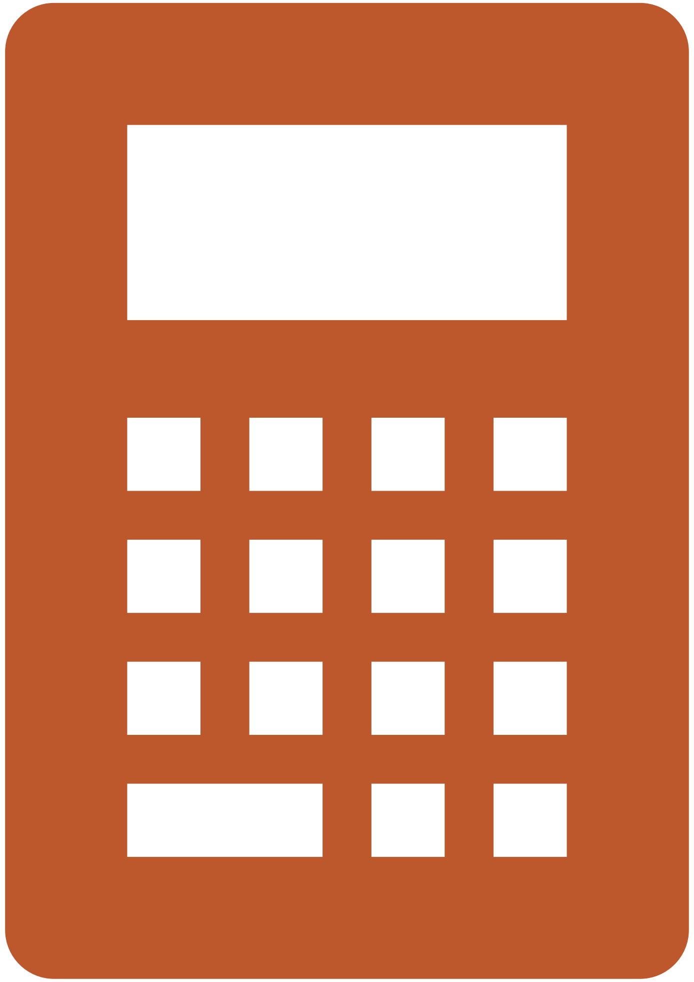
- COST
  - DIRECT
    - MEDICAL
    - NON-MEDICAL
  - INDIRECT
    - LOSS OF WAGES DUE TO ILLNESS
    - DECREASING EARNING ABILITY
    - LONG TERM DISABILITY


DIRECT
MEDICAL
NON-MEDICAL
CONSULTATION AND DIAGNOSIS
DRUGS
TRAVEL
LODGING
FOOD

ASSUMPTIONS

- Average upper middle HH income (McKinsey's report- bird of gold) = Rs 10,00,000/-
- Average HH size of India = 4 (McKinsey's report- bird of gold)
- Income of individual per annum = $\frac{\text{Average HH income}}{\text{Av HH size}}$
- Income per day = $\frac{\text{Income of individual/annum}}{(22*12) -(12+8)}$ X no of days missed due to Illness

- MDR-TB patients are non-adherent complicated TB cases, requiring hospitalization ranging from 3-10 days
- Direct cost assumed for the MDR-TB patients includes the costing of stay according to per day charges which includes all the services provided to the IPD patients such as bedding charges, nursing charges, food charges etc.



COSTING

Excel sheet

HOW CAREDOSE WILL IMPACT?

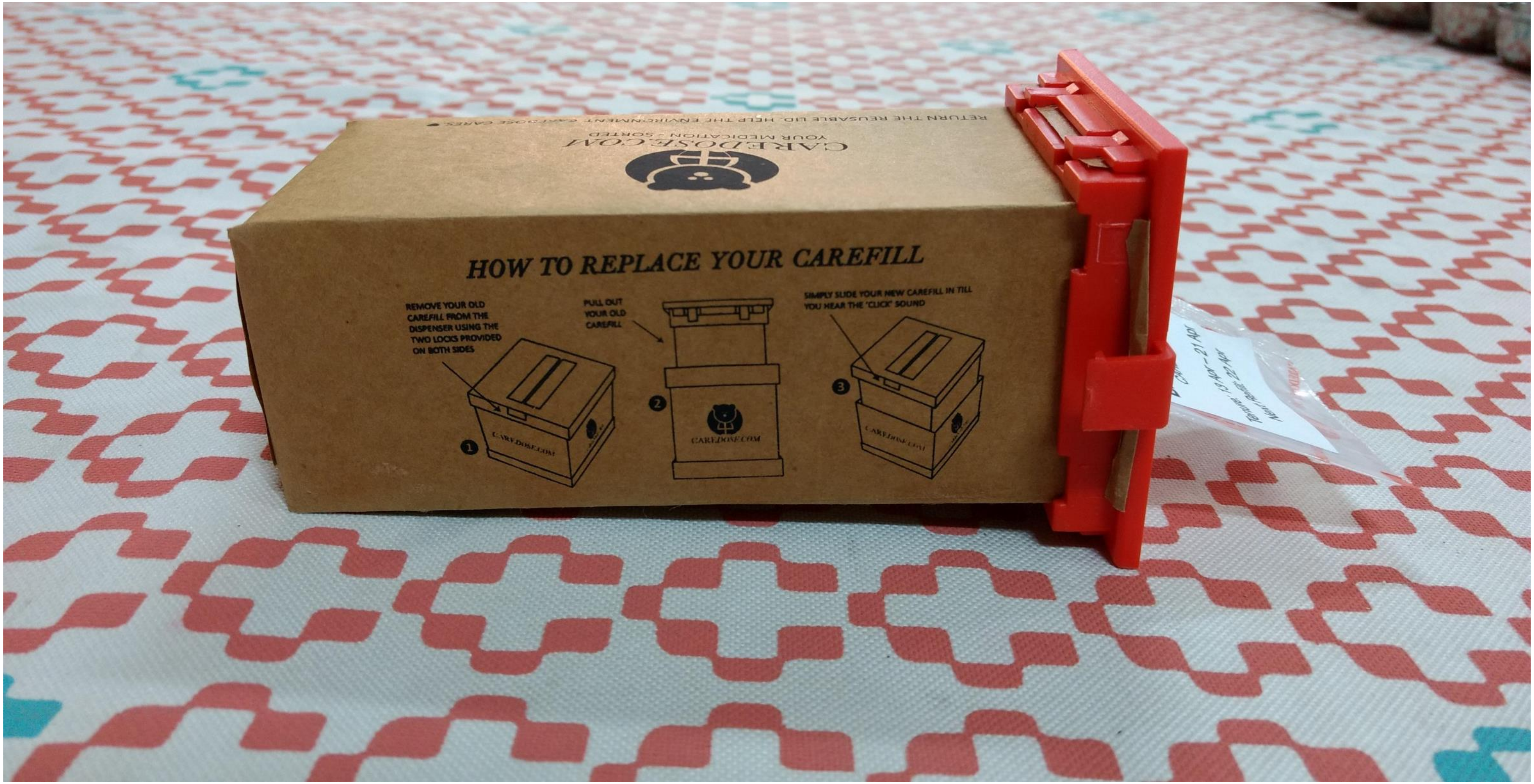

CAREDOSE.COM™


Bhushan Singh
CAREDOSE
Tenure: 13 Apr – 21 Apr
Next Refill: 22 Apr


1 Cap Rifampicin
1 Cap Isoniazid
13/04/2018
7:00AM Saturday
After Food
1 Cap Rifampicin
1 Cap Isoniazid
CAREDOSE.COM
Bhushan Singh
CAREDOSE


CAREDOSE
Tenure: 13 Apr – 21 Apr
Next Refill: 22 Apr
CAREDOSE.COM
YOUR MEDICATION - SORTED
RETURN THE REUSABLE LID. HELP THE ENVIRONMENT. CAREDOSE CARES.♥


CAREDOSE.COM
YOUR MEDICATION - SORTED
RETURN THE REUSABLE LID. HELP THE ENVIRONMENT. CAREDOSE CARES.
CAREFILL


RETURN THE REUSABLE LID. HELP THE ENVIRONMENT
CAREDOSE.COM
YOUR MEDICATION - SORTED
HOW TO REPLACE YOUR CAREFILL
REMOVE YOUR OLD CAREFILL FROM THE DISPENSER USING THE TWO LOCKS PROVIDED ON BOTH SIDES
PULL OUT YOUR OLD CAREFILL
SIMPLY SLIDE YOUR NEW CAREFILL IN TILL YOU HEAR THE 'CLICK' SOUND
1
2
3
CAREDOSE.COM

FEEDBACK FOR CAREDOSE FROM TB PATIENTS

- Patient 1: “ Time and date mentioned on the labels helped me a lot in remembering the doses and decreased the probability of missing doses”
- Patient 2: “This service decreased my out-of-pocket expense to a large scale”
- Patient 3: “Home delivery and timely refill of doses helped in sticking to the regimen”
- Patient 4: “Not being a highly educated person, labels in Hindi helped in reading out the instructions and managing the doses without any confusion”
- Patient 5- “Alerts through SMS make me take the medicines even in the office hours”

CONCLUSION

Non-adherence may lead to:

- Number of **complications and conversion of TB to MDR-TB** because of the resistance developed by bacterial strain due to the discontinuation of dosage
- **Increased financial** burden on patients
- Increased cost to the healthcare system in terms of **increased length of stay, increased no of dosages and increased cost of medications**

CAREDOSE :

- Will help patients to be **adherent** to the treatment
- Availability of **pre-organized dose pouches** with all relevant details around frequency, food directions, time and date of dose
- On-phone **reminders** to the patients for due dose times
- Given non-adherence is a behavioural problem, CAREDOSE is tackling the problem with a behavioural solution, which will lead to a substantial decrease in the cost of the treatment as patients will now be adhered to their prescribed medication


Thank You!