

明日安寧

安寧緩和醫療最適化分析
—以台大醫院為例



OUR MOTIVATION

想成為更好的一個人

家中長輩最近昏倒住院

很想改進點什麼，
讓他們能即使在病痛中也擁有尊嚴。

真的想插管度過人生最後一程嗎？

Outline

- Introduction of Hospice Palliative care
- Problem Definition & Goals
- Research Source
- Analytical Method & Flow
- Phased Achievement & Difficulties
- Future Goal

Introduction of Hospice Palliative Care(HPC)

HPC: mitigatory and supportive medical care

- Relieve terminal illness patients from physical , mental and spiritual pain
- To improve their quality of life.



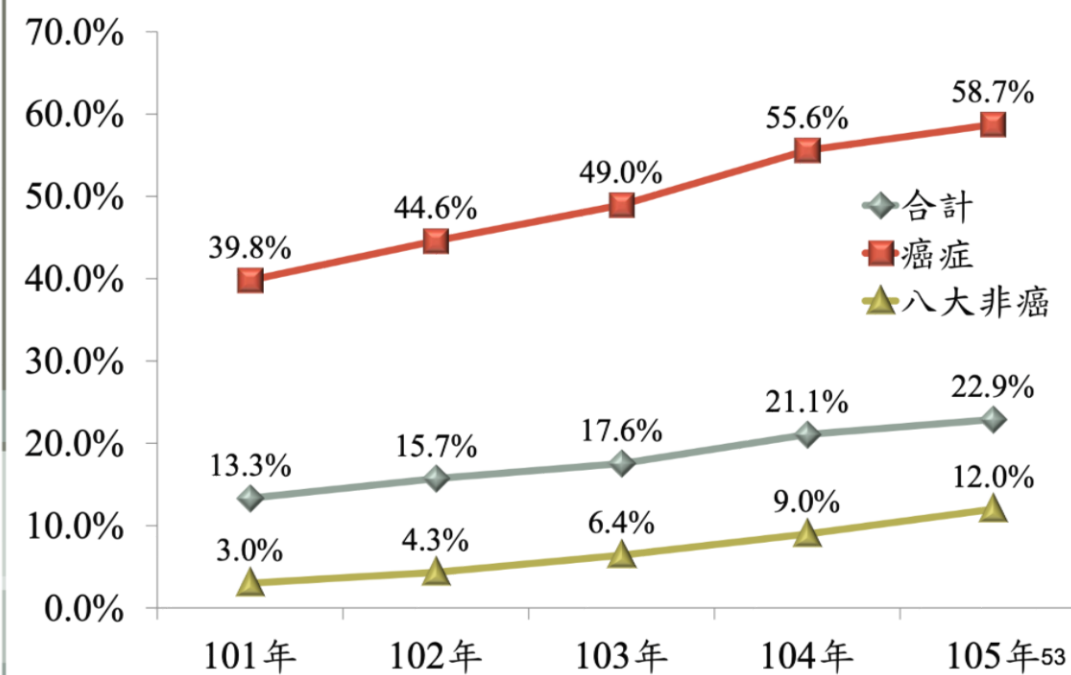
1. 安寧共照是主流--> 好嗎？
2. 八大非癌接受安寧之成長較緩

安寧療護之推動成效-服務人數



52

病患死亡前1年接受安寧療護之比率



53

Problem Definition & Goals

- Problem:
 - 整體安寧流程再前端及後端人員及資源配置並無結構化的模式
- Goal1: *Clinical decision support*
 - Assist in identification of possible end-of-life care patients
- Goal 2: *Predict possible hospice patients*

Conclusion 檢視現行醫護成效與醫療資源配置



Reduce
Patient
Suffering

Improve
the quality of
Hospice care



Unstructured, Bilingual Data

- VS notes
- Admission notes
- Social Worker notes
- Hospice Combined team notes

- 1.已向原團隊住院醫師討論由於目前無法與任何法定家屬取得聯繫,若病人病情不可逆且經兩位專科醫師判斷為末期病患,則本安寧團隊經照會後可同意此病人可不施行心肺復甦術及不施行相關維生醫療
- 2.已請社工持續協助向此病患在美國的女兒取得聯繫,但目前仍無所獲

The 73 y/o man is a case of

1. Enterobacter aerogenes bacteremia with septic shock, complicated with respiratory failure and acute kidney injury, s/p ETT+MV(2014/11/24-)
2. Rhabdomyolysis, suspected pyomyositis related, left psoas muscle.
3. Acute on chronic kidney disease, AKIN stage III, rhabdomyolysis and sepsis related, s/p CVVH(2014/11/24-)
4. Prostate adenocarcinoma, cT3bN1M0, Gleason score 4+5, initial PSA 119.7, under androgen deprivation therapy (2014/11/3-)
5. Suspect diabetes mellitusHe was admitted to MICU from ER due to septic shock with MOF.

Suggst:

Admission Note

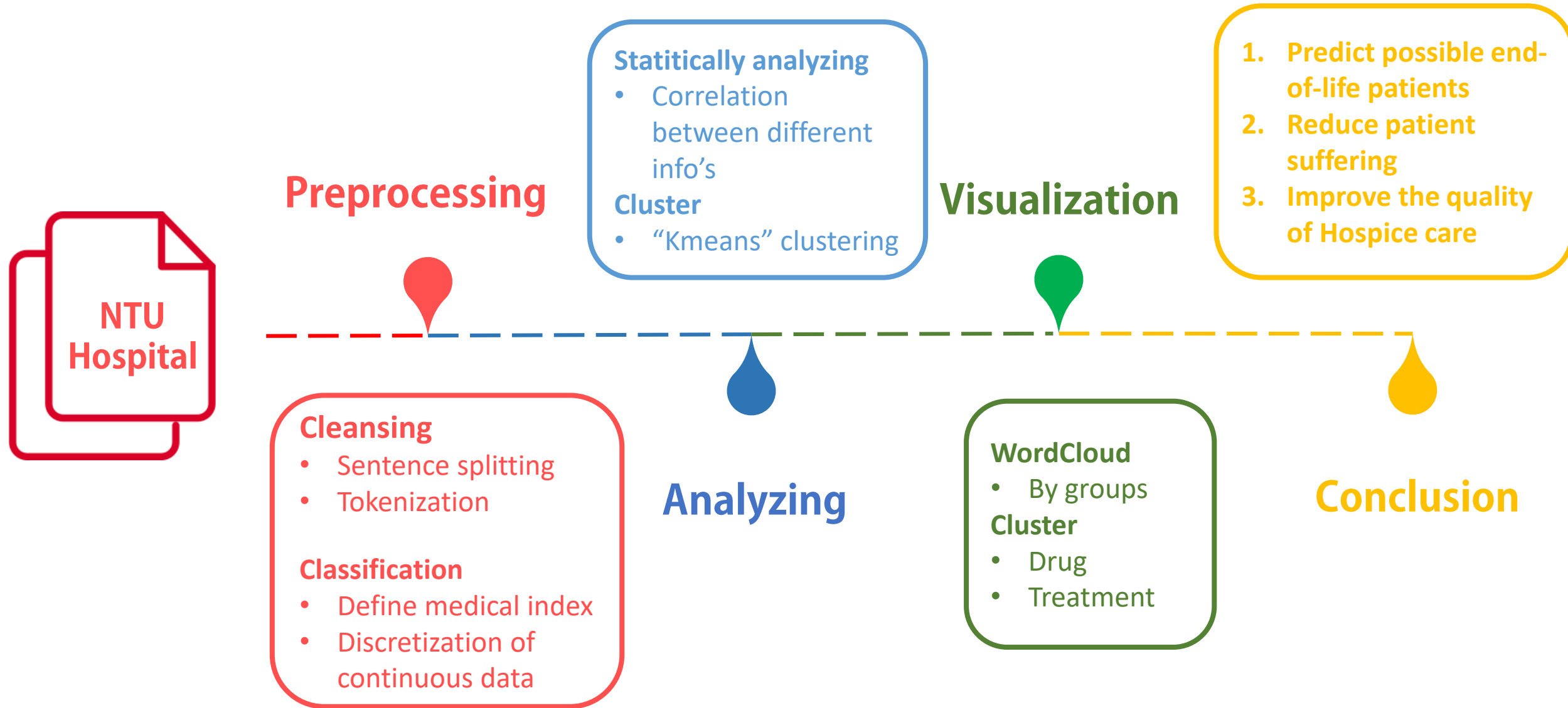
2014/11/24 20:11

主訴(Chief Complaint)

Informant: Social worker of our hospital, previous records and the patient's friend
General weakness and low back pain since 11/19

病史(Brief History)

This 73-year-old man was admitted to our MICU due to septic shock. He had a history of 1. Prostate adenocarcinoma, cT3bN1M0, Gleason score 4+5, initial PSA 119.7, under androgen deprivation therapy (2014/11/3-) He lived himself and didn't had family members. He was independent in his ADLs before this admission, and he had a work (推拿, 至今還有在工作). He was diagnosed of prostate cancer in 2014/10 with an initial presentation of hematuria and urinary retention. Androgen deprivation therapy was given since 2014/11/3. About one week before this admission (11/17), he had an traffic accident. He was sent to 萬芳 H, and no obvious fracture was noted. However, low back pain and general malaise emerged. Due to severe severe low back pain and low limb weakness on 11/19, he was sent to our emergency department on 11/20 for help. On arrival, fever to 38.2°C was noted. CXR showed no obvious infiltration. Blood tests showed marked leukocytosis (16960), increased CK (30176) and Cre (3.4) with relative low CK-MB (582). Empirical cefmetazole was given for possible infection, and hydration was given for rhabdomyolysis. Urologist was consulted on the same day (10/20), and restaging CT scan was suggested. Followed CK gradually decreased but Cre increased on 11/21 (4.2), and nephrologist was



Analytical methods -Preprocessing

檔案整理



定義數值標準



依字詞分類醫學標籤



Jieba切詞

依病人編號做整合歸檔



1-all.txt



2-all.txt



3-all.txt



4-all.txt



5-all.txt



6-all.txt

存活天數依10天分組
c1 = 活了0-10天者
c11 = 活了11-20天者...



live0110.txt



live1120.txt



live30.txt

Analytical methods -Preprocessing

檔案整理



定義數值標準



依字詞分類醫學標籤



JiebaR, strsplit切詞

建立不同類群keyword 字典



treatments.csv



symptoms.csv



drug.csv



disease.csv



disease-expand.csv



dfall.csv

[304]	"atrophy"	"diabetes mellitus"
[307]	"hiv"	"ascites"
[310]	"scoliosis"	"sepsis"
[313]	"shock"	"ten"
[316]	"abdominal"	"aortic"
[319]	"venous"	"muscle"
[322]	"bone"	"type"
[325]	"infection"	"central"
[328]	"pulmonary"	"form"
[331]	"appearance"	"skull"
[334]	"defect"	"protein"
[337]	"failure"	"respiratory"
[340]	"long"	"foot"

Analytical methods -Preprocessing

檔案整理



定義數值標準



依字詞分類醫學標籤



Jieba, strsplit切詞

依照所建立之字典進行切詞

Ex.病人1

```
[[1]]$`abbreviation(expand)`  
[1] "antibiotic"      "prognosis"      "Admission"      "History"        "history"  
[6] "admission"      "fracture"       "Blood"          "dopamine"       "biopsy"  
[11] "antigen"        "unknown"        "Dopamine"       "Assessment"     "negative"  
[16] "headache"       "Cardiovascular" "abnormal"       "Conjunctiva"    "Normal"  
[21] "bilateral"      "Negative"        "BLOOD"          "antibody"       "Without"  
[26] "without"        "lymphadenopathy" "normal"         "catheter"       "dislocation"  
[31] "lateral"        "Diagnosis"      "antibiotics"    "Discharge"      "assessment"  
[36] "disease"        "amount"         "specimen"       "Antibiotic"     "blood"  
[41] "symptoms"      "conjunctiva"    "Bilateral"      "Extremities"  
  
[[1]]$drugs  
[1] "dopamine"        "piperacillin"   "Dopamine"       "Diphenhydramine" "Bethanechol"  
[6] "Glucose"         "cefepime"       "metronidazole"  "vancomycin"     "Furosemide"  
[11] "ampicillin"     "Vancomycin"  
  
[[1]]$disease  
[1] "ascites" "Ascites"  
  
[[1]]$`disease(expand)`  
[1] "shock"          "with"           "focus"         "muscle"
```

Analytical methods -Analysis

Wordcloud



Cluster

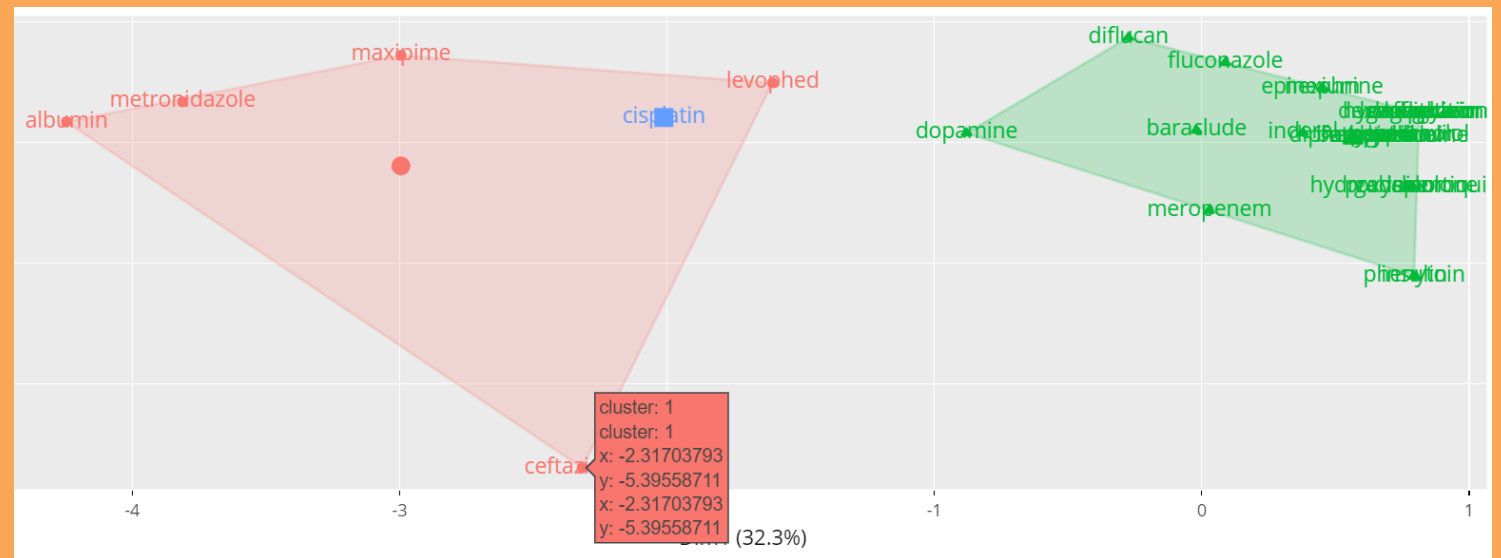


Visualization



解釋關聯性

依存活天數分類Kmeans 分群



Analytical methods -Analysis

Wordcloud



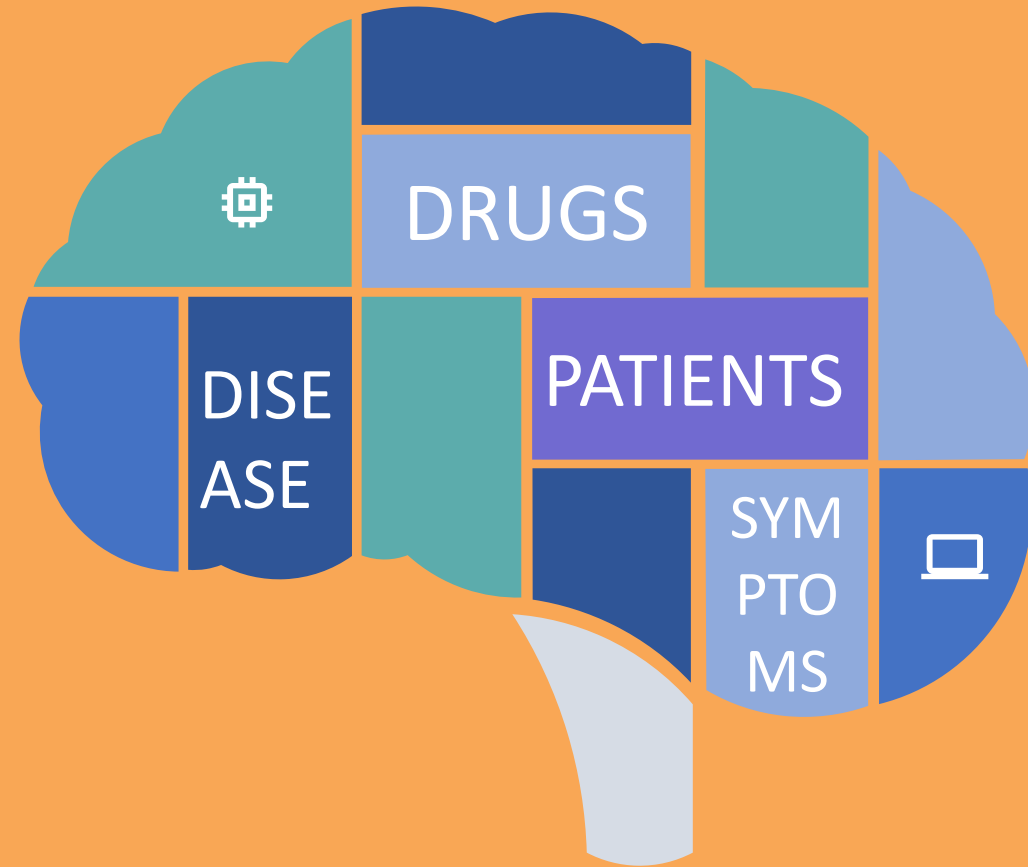
Cluster



Visualization



解釋關聯性





樣本數不足



加入分析進入安寧及非進入患者之同類疾病資訊，能夠更有效辨識出未來會進入安寧風險。

缺乏關鍵資訊
、回測指標

明確的入院、提及時間點、進入安寧治療、家屬陪伴狀況、病人家屬滿意度調查...



專業知識加強



不同領域專業人員加入

Introduction

Problem & Goals

Data Source

Analytical
Method & Flow

Phased Achievements
& Difficulties

Future Goal



分析病患入安寧之可能性



改善服務流程及品質



協助醫師分析及治療病患