Appendix 1:

CUSUM calculation

$a = \ln(1-\beta/\alpha)$

$b = \ln(1- \alpha /\beta)$

$P = \ln(p/1p0)$

$Q = \ln(1-p0/1-p1)$

$s = Q/ (P+Q)$

$h_0 = -b/ (P+Q)$ $h_1 = a/ (P+Q)$

p_0 = acceptable failure rate

p_1 = unacceptable failure rate

α = probability of Type 1 error

β = probability of Type 2 error

h_0 = lower limit on CUSUM plot

h_1 = upper limit on CUSUM plot

h_0 to h_1 = Decision interval

Cusum plot starts at '0'. With each success the value decreases by a variable 's' which equals to 0.05 in this study. With each failure it increases by the value of '1-s'. The decision interval within which the curve exists is defined between h_0 and h_1 +2.28 to -2.28. Calculations showed that 46 successful attempts with no failure were required for reaching the lower boundary limit of the CUSUM curve With each failure further successful attempts were required to ensure the curve reached lower boundary limit (- 2.28) on the graph.
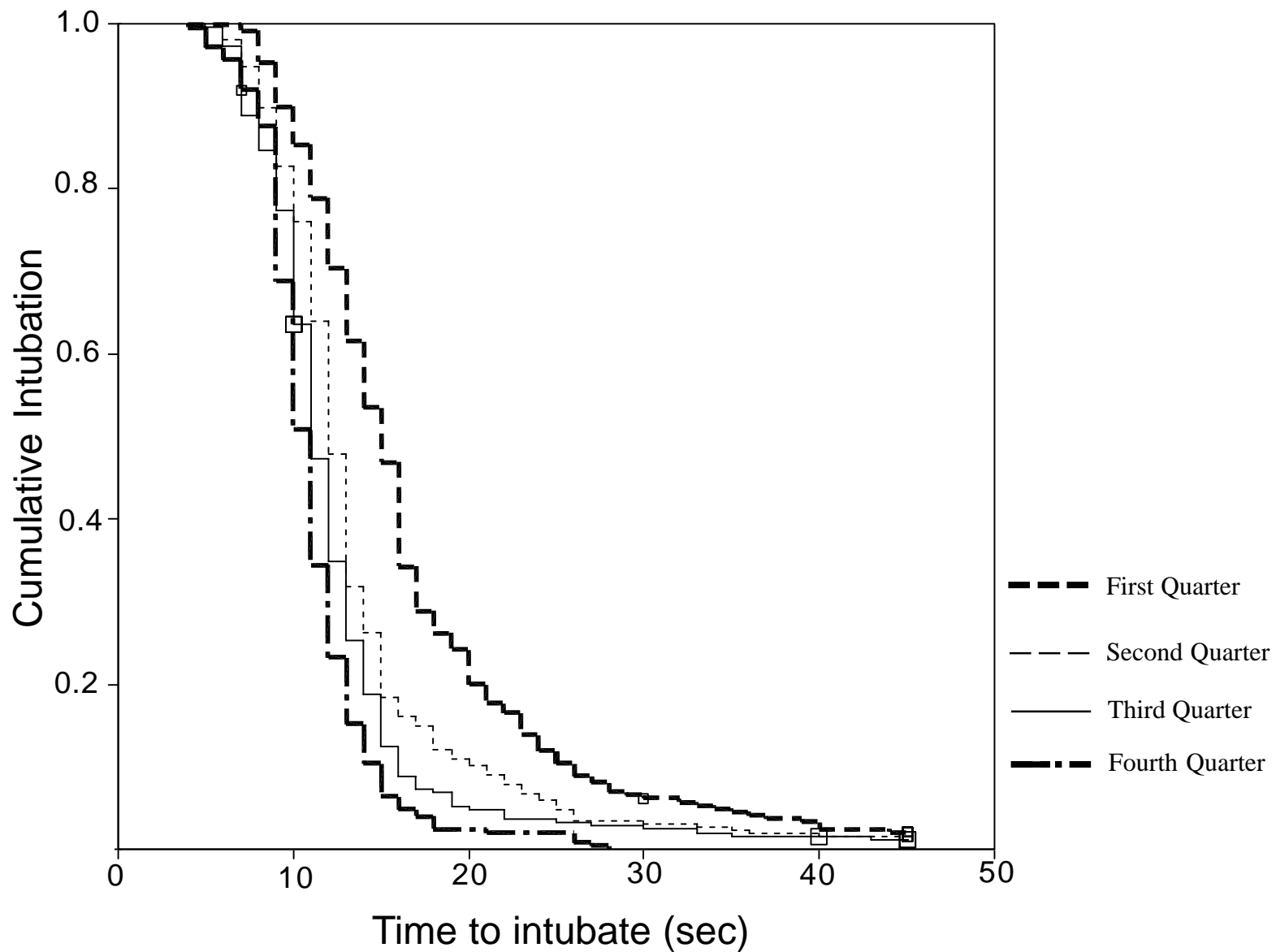

CUSUM Curves for the candidates

4

2

0

-2

-2.28

-4

15

13

11

9

7

5

3

1

Cusum

-2. 28

75

Intubation attempts
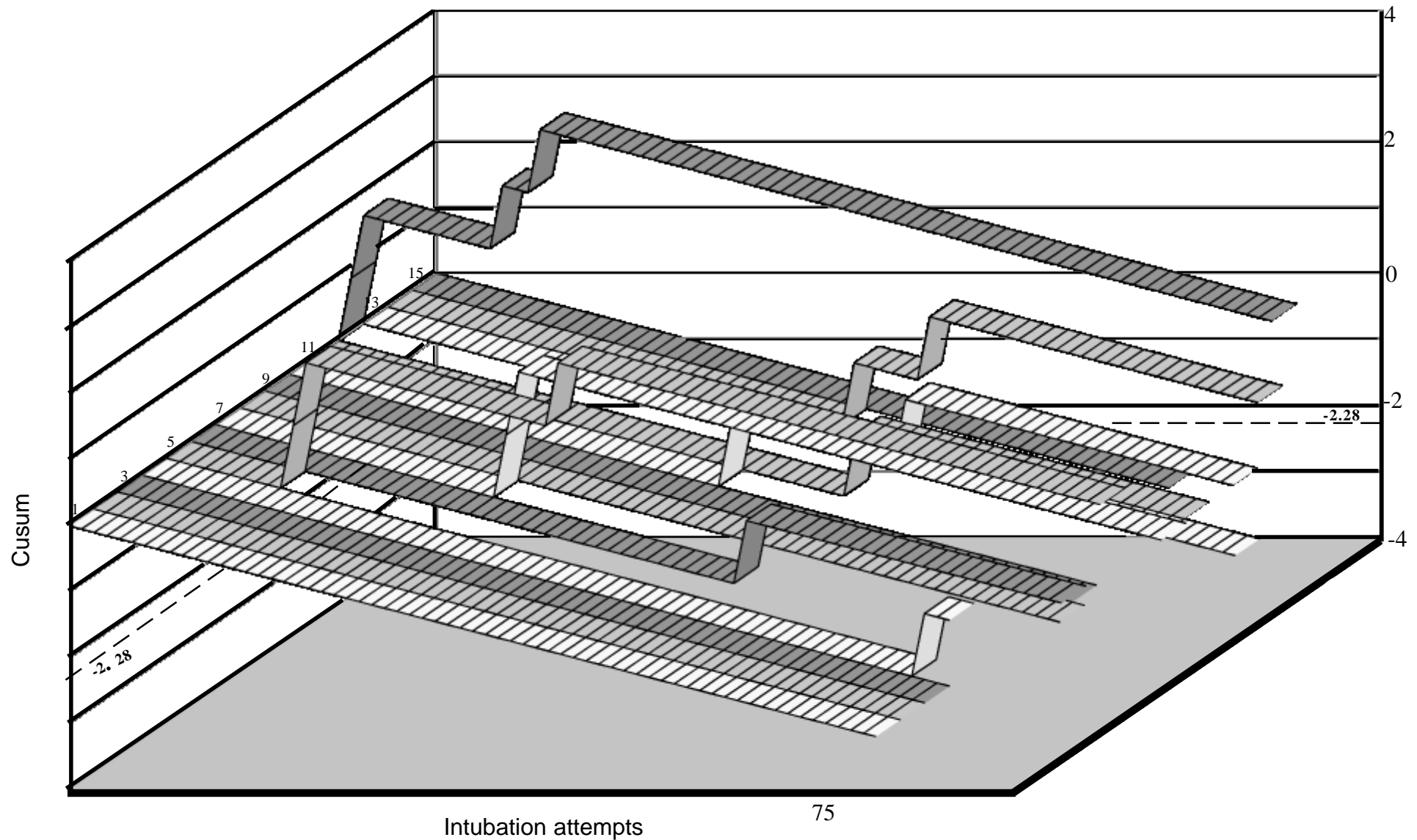
The Cusum curves for the candidates are indicated in the line chart. The CUSUM is indicated on the X axis, the number of attempts is indicated on the Y axis. Each of the small horizontal line along the Z axis on the individual curve represents an attempt at intubation. With each successful attempt, the cusum progressively decreases by 's' until it crosses the lower boundary level whereupon competence is achieved (eg candidates 1 &2). When there is an unsuccessful attempt, the CUSUM increases by 1-s as seen in candidates 5 &6.

KAPLAN-MEIER SURVIVAL CURVE

Cumulative Intubation (y-axis: 1.0, 0.8, 0.6, 0.4, 0.2)

Time to intubate (sec) (x-axis: 0, 10, 20, 30, 40, 50)

Legend:
- First Quarter
- Second Quarter
- Third Quarter
- Fourth Quarter

Pooled data from all the candidates over four quarters is depicted in this Kaplan-Meier survival graph with 'successful intubation' being the 'event' and 'time to intubate' being the 'survival'.