

YOU & MATHS **Non-smoking mothers** Below is a table with the numbers of non-smoking mothers in one year at delivery in a small town called Pureville. Calculate the average age of the non-smoking mothers in Pureville. What is their median age?

| Age | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Number | 7 | 8 | 9 | 10 | 12 | 3 | 2 | 5 | 4 | 5 | 2 | 4 | 2 | 0 | 1 |

The average age of the non-smoking mothers in Pureville is:

$$\frac{7 \cdot 21 + 8 \cdot 22 + 9 \cdot 23 + 10 \cdot 24 + 12 \cdot 25 + 3 \cdot 26 + 2 \cdot 27 + 5 \cdot 28 + 4 \cdot 29 + 5 \cdot 30 + 2 \cdot 31 + 4 \cdot 32 + 2 \cdot 33 + 35}{7 + 8 + 9 + 10 + 12 + 3 + 2 + 5 + 4 + 5 + 2 + 4 + 2 + 0 + 1} =$$

$$= \frac{1899}{74} \simeq 25,7.$$

In order to calculate the median age of non-smoking mothers we have to compute the cumulative percentages. The total frequency is 74, then the median age is the semi-sum of the elements in positions 37 and 38 from the cumulative percentage column. These are both 25, so the median age of the non-smoking mothers is 25.

| X_i | F_i | F'_i |
|--------------|-------|--------|
| 21 | 7 | 7 |
| 22 | 8 | 15 |
| 23 | 9 | 24 |
| 24 | 10 | 34 |
| 25 | 12 | 46 |
| 26 | 3 | 49 |
| 27 | 2 | 51 |
| 28 | 5 | 56 |
| 29 | 4 | 60 |
| 30 | 5 | 65 |
| 31 | 2 | 67 |
| 32 | 4 | 71 |
| 33 | 2 | 73 |
| 34 | 0 | 73 |
| 35 | 1 | 74 |
| Total | 74 | |