EARTHQUAKE VICTIMS

INTRODUCTION

Note: This is a fictional story based on a real event. It uses actual STRs and allele data.

In October 2016, an earthquake rocked central Italy. Several American tourists were among the victims. A mother and father in Miami lost contact with their son, who had been staying in a hotel in the city of Norcia, near the earthquake's epicenter. He had been traveling with his cousin. Italian rescue workers found the remains of two young men among the ruins of the hotel where the cousins were staying. Forensic scientists in Italy isolated DNA from the two victims and sent the results to a forensic lab in the United States. The parents in Miami sent blood samples to the same lab so that they could be analyzed and compared to those of the earthquake victims.

PROCEDURE

Figure 1 and Table 1 show partial DNA fingerprints of the two victims and those of the mother and father awaiting news in Miami. Analyze the data from the figure first and answer Question 1. Then look at the additional data provided in the table and answer questions 2 through 4.

1. Based on the data in Figure 1, can you make a claim about whether one of the victims is the son of the parents in Miami? Use evidence from the figure to support your claim.

2. Now look at the additional data provided in Table 1. Using all the available data, can you make a claim about whether one of the victims is the son of the parents in Miami? Provide at least two pieces of evidence to support your claim.

3. The cousin was on the maternal side, which means that the mother of the missing son is the aunt of the missing cousin. Is it possible that one of the victims is the nephew? Provide evidence to support your claim. (Think about what percentage of DNA a nephew shares with an aunt.)

4. Explain why forensic scientists typically use 13 STRs when making claims of identification rather than just a few.

Earthquake Victims

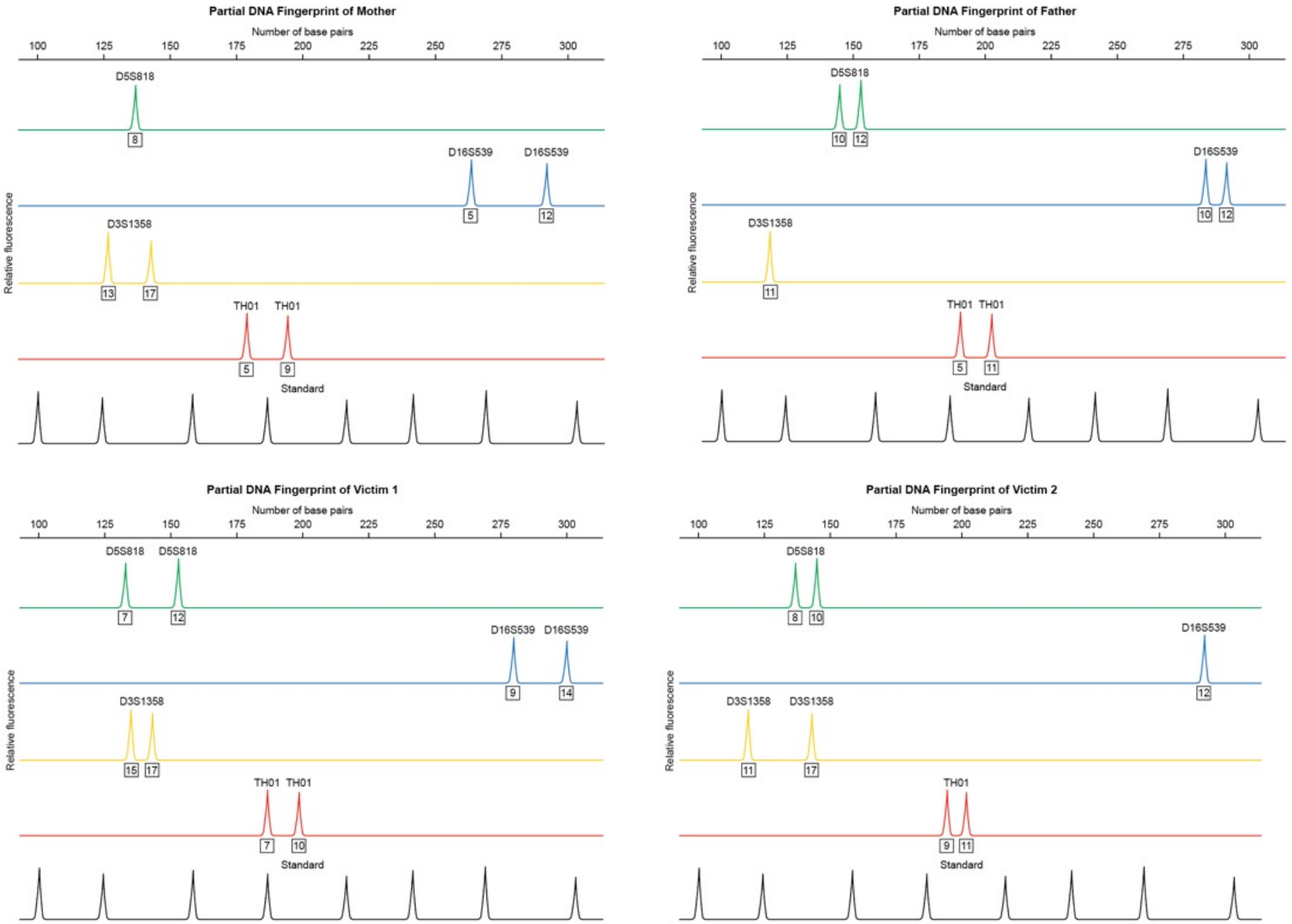

Figure 1. Mock DNA profiles of the parents of the American tourist and two bodies found in the hotel in Norcia. Only four STRs are shown: D5S818, D16S539, D3S1358, and TH01. A complete profile, however, would include additional STRs.

Table 1. Data from nine additional STR loci for the mother and father and two earthquake victims.

STR Loci	Mother's alleles	Father's alleles	Victim 1's alleles	Victim 2's alleles
D8S1179	15, 15	9, 11	9, 10	11, 15
TPOX	8, 11	5, 5	5, 10	13, 13
D18S51	17, 19	12, 24	9, 22	10, 24
CSF1PO	9, 9	8, 8	12, 12	9, 15
D7S820	8, 10	15, 15	6, 10	5, 5
D21S11	30, 37	28, 37	24, 24	28, 30
vWA	10, 12	23, 23	12, 12	11, 23
D13S317	10, 15	9, 12	11, 15	9, 11
FGA	17, 21	30, 46	19, 23	21, 28