IN THE SUPREME COURT OF CALIFORNIA

THE PEOPLE,	)	
	)	
Plaintiff and Respondent,	)	
	)	S130157
v.	)	
	)	Ct.App. 1/3 A101459
WILLIAM CURTIS WILSON,	)	
	)	Solano County
Defendant and Appellant.	)	Super. Ct. No. FCR182521
_____	)	

　　　　This murder case presents a narrow, but important, question regarding the admissibility of deoxyribonucleic acid (DNA) evidence to prove identity in criminal prosecutions. A DNA comparison of blood found at the crime scene with defendant's blood resulted in a match. That is, defendant's genetic profile matched that of the blood at the crime scene so that he could not be excluded as a donor of that blood. Similarly, a DNA comparison of blood found on defendant's pants when he was arrested with the victim's blood resulted in a match, so that the victim could not be excluded as a donor of that blood. Obviously, evidence tending to show that defendant's blood was found at the crime scene, and that the victim's blood was on defendant's pants, would be highly probative to whether defendant was the killer.

　　　　When a match is found, the next question is the statistical significance of the match. Of course, a match is less significant if the blood could have come from many persons rather than from only a few. Experts calculate the odds or

percentages—usually stated as one in some number—that a random person from the relevant population would have a similar match. The question here revolves around exactly what is the relevant population. The question is complicated by the fact that the odds vary with different racial and ethnic groups. Because of this variation, separate databases are maintained for different population groups, and the odds for each group are calculated separately. In this case, as in many cases, no evidence exists of the racial or ethnic identity of the perpetrator other than evidence indicating that defendant was the perpetrator. Over defense objection, the trial court permitted the prosecution to present evidence of the odds as to the three most common population groups in this country—Caucasians, African-Americans, and Hispanics. For example, the evidence showed that only one Caucasian in 96 billion would match the crime scene blood that matched defendant's profile.

Defendant contends the court erred. Relying heavily on the opinions in *People v. Pizarro* (1992) 10 Cal.App.4th 57 (*Pizarro I*), and especially, *People v. Pizarro* (2003) 110 Cal.App.4th 530 (*Pizarro II*), he argues that evidence regarding any particular population group is irrelevant absent independent evidence that the perpetrator was a member of that group. The Court of Appeal concluded that the trial court correctly admitted the evidence. We agree. As Justice Parrilli, author of the majority opinion below, stated, "When the perpetrator's race is unknown, the frequencies with which the matched profile occurs in various racial groups to which the perpetrator *might* belong are relevant for the purpose of ascertaining the rarity of the profile."

I. FACTS AND PROCEDURAL HISTORY

Around 6:15 p.m. on April 6, 2000, the body of 13-year-old Sarah Phillips was found on the living room floor of her Vacaville home. She had been strangled

with a telephone cord, and her body had suffered multiple bruises, scrapes, and scratches. Her pants and panties had been removed, and her shirt was pushed up.

Defendant was arrested around 2:00 a.m. on the morning after the killing and charged with her murder. He had visited the victim's house regularly while dating her older sister three years earlier. DNA evidence as well as other evidence implicated him as the perpetrator. The Court of Appeal summarized the non-DNA evidence: "[Defendant] aggressively propositioned several women before the assault on Sarah, showing interest in whether they lived alone; he admitted speaking with Sarah around the time of the killing when she was alone at her home, where the killing occurred; he was seen by witnesses in the area before the killing, without scratches, and after the killing, with scratches consistent with the struggle indicated by the crime scene evidence; and shortly after the murder he told a witness he had done something bad, which he could not 'fix.' "

The prosecution also presented DNA evidence. Three kinds of DNA tests (D1S80, DQA1 polymarker, and STR) were performed on bloodstains found on the victim's clothing and on defendant's clothing when he was arrested. All of the tests matched defendant's genetic profile to blood on the victim's jeans, and the victim's profile to blood on defendant's pants. The STR testing also matched the victim to a hair found in defendant's pants, and both the victim and defendant to blood found under the victim's fingernail.

The STR test was the most sensitive. It compared nine genetic markers and included a marker for gender discrimination. Nicola Shea, a criminalist with the Sacramento laboratory of the California Department of Justice (Department), was the prosecution's STR expert. She testified that, to help juries understand the significance of a DNA match, the Department followed the statistical approach recommended by a 1996 report of the National Resource Center for presenting the frequency with which genetic profiles occur. (Nat. Resource Center, The

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Evaluation of Forensic DNA Evidence (1996) (hereafter 1996 NRC Report).) The
Department used databases that the Federal Bureau of Investigation published in
the Journal of Forensic Sciences reflecting profile frequencies in the Caucasian,
Hispanic, and African-American populations, "because those are the major
populations in our country and in our state."

Shea testified she used all three databases to avoid making assumptions
about the ethnic background of the perpetrator. Data for other groups, such as
Native Americans, would also be compared if information had indicated another
group might be a source of the evidence sample—for example, if the crime had
occurred on an Indian reservation. She explained that "the same profile will show
up with a different frequency in the different populations." However, she also said
that "the three populations given give you a ballpark of how often you would
expect to see that profile in those populations. If something is extremely rare in
those three populations, you might expect it for that many markers to be extremely
rare in one of the other populations." When nine genetic markers are used in the
analysis, the result would be a "pretty discriminating number" no matter what
population database was used.

Defendant's genetic profile would be expected to occur in one of 96 billion
Caucasians, one of 180 billion Hispanics, and one of 340 billion African-
Americans. The victim's genetic profile would be expected to occur in one of 110
trillion Hispanics, one of 140 trillion Caucasians, and one of 610 trillion African-
Americans. Criminalist Shea noted that these profiles were extremely rare; the
world contains only about six and a half to seven billion human beings.

Defendant objected to the introduction of these profile frequencies, arguing
that the prosecution had failed to lay a foundation for this evidence because it did
not establish the race of the persons who left the blood samples. The trial court
disagreed and admitted the evidence. The jury found defendant guilty of first

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degree murder with use of a dangerous weapon during the commission of an attempted rape and a lewd act on a child.

Defendant appealed. The Court of Appeal found that the trial court properly admitted the DNA evidence and affirmed the judgment. We granted review to resolve a conflict between this opinion and *Pizarro II*, *supra*, 110 Cal.App.4th 530.

II. DISCUSSION

"DNA analysis . . . is a process by which characteristics of a suspect's genetic structure are identified, are compared with samples taken from a crime scene, and, if there is a match, are subjected to statistical analysis to determine the frequency with which they occur in the general population." (*People v. Barney* (1992) 8 Cal.App.4th 798, 805.) "[O]nce analysis and comparison result in the declaration of a 'match,' the DNA profile of the matched samples is compared to the DNA profiles of other available DNA samples in a relevant population database or databases in order to determine the statistical probability of finding the matched DNA profile in a person selected at random from the population or populations to which the perpetrator of the crime might have belonged." (*People v. Soto* (1999) 21 Cal.4th 512, 518.)

As the Court of Appeal in this case explained, "Profile frequencies within the major racial groups in the United States (Caucasian, African-American, Hispanic, East Asian, and Native American) vary to such an extent that separate DNA databases are maintained for the purpose of providing accurate estimates of profile frequency. (1996 NRC Rep., pp. 28, 57-58, 98, 151; see also *People v. Soto*, *supra*, 21 Cal.4th at p. 526, fn. 18.)" (Fn. omitted.) The question here is which, if any, of these databases are relevant when the racial identity of the persons who left the test samples is unknown.

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The trial court permitted the prosecution to present evidence of profile frequency within the three most common populations in this state and country— Caucasian, Hispanic, and African-American. Defendant contends that because no independent evidence exists that the donor of the blood samples at the crime scene and on his pants belonged to any particular population group, the frequency of these groups is irrelevant. He relies primarily on the two *Pizarro* cases. (*Pizarro I*, *supra*, 10 Cal.App.4th 57; *Pizarro II*, *supra*, 110 Cal.App.4th 530.)

The *Pizarro* defendant was half Hispanic and half Caucasian. Because of this, the prosecution expert calculated the odds of an Hispanic and a Caucasian being the donor of a certain semen sample. (*Pizarro I*, *supra*, 10 Cal.App.4th at p. 64; *Pizarro II*, *supra*, 110 Cal.App.4th at p. 631, fn. 81.) In the first appeal, the Court of Appeal held that the prosecution had not established that the procedures, including use of the population data bases, had gained general acceptance in the scientific community. (See generally *People v. Leahy* (1994) 8 Cal.4th 587.) It remanded the matter to the trial court for an evidentiary hearing. (*Pizarro I*, *supra*, at pp. 95-96.) On remand, the trial court held the hearing, concluded that the evidence had been properly admitted, and reinstated the judgment. The Court of Appeal reversed again in *Pizarro II*, *supra*, 110 Cal.App.4th 530.

In part, the *Pizarro* opinions condemned presenting evidence solely of the odds that a person of the *defendant's* population group was the donor. (See *Pizarro I*, *supra*, 10 Cal.4th at pp. 93-94; *Pizarro II*, *supra*, at p. 629-631 & fn. 79.) On this point, the court was on solid ground. As one recent commentator has explained, "One strangely persistent fallacy in the interpretation of DNA evidence is that the relevant ethnic or racial population in which to estimate a DNA profile frequency necessarily is that of the defendant. The issue has been cogently analyzed, and it should be clear that the relevant population is the entire class of plausible perpetrators." (Kaye, *Logical Relevance: Problems with the Reference*

Population and DNA Mixtures in People v. Pizarro (2004) 3 Law, Probability & Risk 211, 211 (hereafter Kaye[1]); see also the authority collected in *Pizarro II*, *supra*, at pp. 629-630, fn. 79.) Accordingly, we agree with the *Pizarro* opinions that a trial court should not admit evidence of the odds solely regarding the defendant's population group. Similarly, when the match involves the victim, the court should not admit evidence of the odds solely regarding the victim's population group.

As the Court of Appeal explained, this case does not present this problem: "[T]here is no suggestion in the record that the databases used by the DNA expert for calculating profile frequencies were chosen based on Wilson's or Sarah's racial background. Witnesses described Wilson as a light-skinned Black man. The police report described Sarah as White. Shea testified that she followed standard practice of determining the frequency of the matched profiles using Caucasian, Hispanic, and African-American databases, in order to avoid making assumptions about the ethnic background of the perpetrator or the victim. (Shea misspoke in reference to the 'victim,' whose ethnic identity was known; it was the ethnicity of the person who left the bloodstains and the hair on Wilson's pants, which matched Sarah's profile, that was in question.)"

But the court in *Pizarro II* went on to say that, absent independent evidence of the population group to which the perpetrator belonged, *any* evidence regarding *any* particular group was irrelevant and hence inadmissible. "[I]n the absence of sufficient evidence of the perpetrator's ethnicity, *any* particular ethnic frequency is irrelevant. The problem is . . . one of preliminary fact . . . . It does not matter how

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[1]   Professor Kaye was a member of the Committee of DNA Forensic Science that helped prepare the 1996 NRC Report. We have treated that report as authoritative. (*People v. Soto*, *supra*, 21 Cal.4th at p. 516; *People v. Venegas* (1998) 18 Cal.4th 47, 89; see also *People v. Reeves* (2001) 91 Cal.App.4th 14, 41-42.)

many Hispanics, Caucasians, Blacks, or Native Americans resemble the perpetrator if the perpetrator is actually Asian. If various ethnic frequencies are presented to the jury, each will have been admitted without adequate foundation." (*Pizarro II*, *supra*, 110 Cal.App.4th at p. 632.) The court believed that the proponent of the evidence (here the prosecution) need only present evidence of this preliminary fact—the perpetrator's ethnicity—"sufficient for a trier of fact to reasonably find by a preponderance of the evidence that the fact exists." (*Pizarro II*, *supra*, 110 Cal.App.4th at pp. 542-543.)

This latter conclusion is very significant. Professor Kaye summarized its potential impact. "[T]he *Pizarro* court announced that giving a range of frequencies for the major racial or ethnic groups in the United States is unacceptable. Since providing statistics from several racial groups is the standard way of assessing the significance of a match in cases in which the racial and ethnic status of the perpetrator of the crime initially is unknown, the opinion casts doubt on the outcomes of innumerable cases." (Kaye, *supra*, 3 Law, Probability & Risk at p. 214.)

The Court of Appeal here disagreed with this portion of *Pizarro II*. "We believe the *Pizarro* court's insistence that the database used to calculate the profile frequency must be drawn from the perpetrator's racial group was misplaced. The random-match probability is meant to measure the rarity of the genetic profile detected in the evidence sample and in the defendant by estimating the frequency with which it occurs in the population of *possible suspects*. As explained in the 1996 NRC Report:

" 'Suppose that a DNA sample from a crime scene and one from a suspect are compared, and the two profiles match at every locus tested. Either the suspect left the DNA or someone else did. We want to evaluate the probability of finding this profile in the "someone else" case. That person is assumed to be a random

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member of the population of possible suspects. So we calculate the frequency of

the profile in the most relevant population or populations. The frequency can be

called the random-match probability, and it can be regarded as an estimate of the

answer to the question: What is the probability that a person *other than the*

suspect, randomly selected from the population, will have this profile? The

smaller that probability, the greater the likelihood that the two DNA samples came

from the same person.' (1996 NRC Rep., p. 127, italics added.)

       "The population of possible suspects frequently includes a range of

'potential perpetrators,' whose numbers and race depend on what is known about

the circumstances of the crime. When the perpetrator's race is unknown, the

frequencies with which the matched profile occurs in various racial groups to

which the perpetrator *might* belong are relevant for the purpose of ascertaining the

rarity of the profile."

       We agree with the Court of Appeal. Relevant evidence is evidence "having

any tendency in reason to prove or disprove any disputed fact that is of

consequence to the determination of the action." (Evid. Code, § 210.) " 'The test

of relevance is whether the evidence tends, "logically, naturally, and by reasonable

inference" to establish material facts such as identity, intent, or motive.' " (*People*

v. Harris (2005) 37 Cal.4th 310, 337.) As Professor Kaye notes, "Contrary to the

Pizarro court's assertions, in a 'general population case'—one in which the

investigation cannot be limited to a particular racial group—the statistics for a

range of groups surely are relevant." (Kaye, *supra*, 3 Law, Probability & Risk at

pp. 215-216.) It is relevant for the jury to know that most persons of at least major

portions of the general population could not have left the evidence samples. This

conclusion is consistent with the recommendations of the 1996 NRC Report. "In

the great majority of cases, very little is known about the person who left the DNA

evidence . . . . It might be known that the DNA came from a white person, in

which case the white database is appropriate. If the race is not known or if the population is of racially mixed ancestry, the calculations can be made with each of the appropriate databases and these presented to the court." (1996 NRC Rep., *supra*, at pp. 113-114.) Accordingly, the report's recommendation 4.1 states: "If the race of the person who left the evidence-sample DNA is known, the database for the person's race should be used; if the race is not known, calculations for all racial groups to which possible suspects belong should be made." (*Id*. at p. 122.)

This precise issue was not before us in *People v. Soto*, *supra*, 21 Cal.4th 512, but there we explained why statistics for a range of population groups should be given. In *Soto*, the expert calculated the statistical probabilities "in the databases of DNA collected from *representative populations*," including four Orange County databases—Hispanic, Caucasian, Black, and Vietnamese—as well as four Federal Bureau of Investigation databases—Southwest Hispanic (Texas), Southeast Hispanic (Florida), United States Black, and United States Caucasian. (*Id*. at pp. 531-532, italics added.) As we explained, the expert's "use of all these databases in his calculations reflected an objective of finding the probabilities of a random match in databases representing all possible perpetrators. Even though defendant is Hispanic, a possible perpetrator other than defendant could have belonged to some other ethnic group." (*Id*. at p. 532, fn. 27, citing recommendation 4.1 of 1996 NRC Rep., *supra*, at p. 122.)

We also disagree with the *Pizarro* court's conclusion that if the proponent of the evidence presents evidence sufficient for the trier of fact to find, by a preponderance of the evidence, that the perpetrator belonged to a particular population group, probability evidence as to that group, *but no other*, is relevant and admissible. Excluding probability evidence about any but the most likely group could deprive the jury of potentially crucial evidence. If, for example, the jury believed it 51 percent likely the perpetrator was Caucasian, providing it with

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the probability only for Caucasians would leave it uninformed regarding the 49 percent possibility the perpetrator was of some other population group. Professor Kaye explains: "[W]e can never know the perpetrator's ancestry to a certainty. Suppose that the victim had lived and identified the man who assaulted her as 'Asian.' The cross-racial identification, made under great stress, could be mistaken. If an Asian defendant wished to argue that the actual rapist might have been Hispanic, it would assist the jury to know whether the DNA types are extremely rare among Hispanics. Indeed, in the limit, if no Hispanic had the requisite genotype, the Hispanic data would refute defendant's alternative hypothesis. Conversely, if every Hispanic had the incriminating genotype and hardly any Asians did, the DNA evidence would be much less probative of the Asian defendant's guilt than the Asian-only figure would suggest. To withhold the Hispanic data on the ground that it is irrelevant because the other evidence in the case points to an Asian could be a serious mistake." (Kaye, *supra*, 3 Law, Probability & Risk at p. 215.)

If a defendant wanted to argue that the perpetrator might have been a member of a particular population group for which the odds were more favorable to the defense, surely it would be relevant and permissible to admit evidence of those odds. Similarly, the prosecution should be permitted to present evidence of a representative range of groups.

"Moreover, even if we could know that the perpetrator was, let us say, Asian, with sufficient certainty to exclude all other possibilities from rational discourse, the [*Pizarro*] court's logic might lead to the paradoxical conclusion that the frequency data for Asians also is irrelevant. Asian-Americans, after all, are not a homogeneous group. There are many subgroups—Chinese, Indonesian, Japanese, and Korean, to name a few—and each subgroup can be parsed still more finely." (Kaye, *supra*, 3 Law, Probability & Risk at p. 215.)

The *Pizarro* court and, in turn, defendant, present three objections to giving the jury the probabilities of a representative range of population groups, none persuasive. First, the court believed that, "in the absence of sufficient evidence of the perpetrator's ethnicity, *any* particular ethnic frequency is irrelevant." (*Pizarro II*, *supra*, 110 Cal.App.4th at p. 632.) We disagree for the reasons discussed.

Second, the court believed that "the improper mention of ethnicity unfairly and unjustifiably encourages the jurors to focus on ethnicity and race—specifically the ethnicity and race of the defendant, the only suspect before them." (*Pizarro II*, *supra*, 110 Cal.App.4th at p. 632.) This is a legitimate concern if, as in *Pizarro* itself, the expert provides the frequency probability of only the defendant's own population group. But here, Criminalist Shea gave the statistics as to a range of groups. In a concurring opinion, Justice Pollak aptly responded to this objection. "While we are in complete agreement with the importance of excluding racial stereotypes and prejudices from the courtroom, this rationale provides no justification for excluding evidence of objectively established physical differences among racial populations when such differences are relevant to the issues being tried. In order to determine the significance of the match between defendant's DNA and the crime scene DNA, it is necessary—and relevant—to establish the likelihood that the crime scene DNA came from another person. There is agreement within the scientific community that genetic frequencies differ for different racial or ethnic populations, and that frequency data would be less accurate without such differentiation. By presenting the data for the major racial components of the population, when there is no independent evidence of the perpetrator's race, the prosecution presents the data necessary for the jury to evaluate the likelihood that the crime scene DNA came from someone other than the defendant. Presenting the objective data in the manner in which such information is collected and analyzed within the scientific community does not

inject inappropriate racial assumptions or issues into the litigation. To the contrary, in presenting data for the most numerous racial groups in the population, the focus is removed from the race of the defendant."

As Professor Kaye observes, "there is no obvious reason to think that telling the jury that the incriminating genotypes occur infrequently in every major racial or ethnic group will encourage the jurors to assume that the crime must have been committed by a member of the defendant's racial or ethnic group. In fact, giving a range of statistics could discourage the jury from jumping to an unjustified conclusion." (Kaye, *supra*, 3 Law, Probability & Risk at p. 216.)

Third, the *Pizarro* court believed that if the expert testifies to a range of probabilities, "the jury hears unjustifiably damaging evidence because the various ethnic frequencies create a range extending from the most conservative and beneficial to the defendant to the most rare and damning to the defendant." (*Pizarro II*, *supra*, 110 Cal.App.4th at p. 632.) The court was concerned that the jury would "likely focus on" the most damaging figure. (*Ibid*.) "The greater the disparity between the perpetrator's true frequency and the range's most damaging extreme, the greater the prejudice the defendant will suffer from mention of that extreme. Without adequate evidence of the perpetrator's ethnicity, there is no justification for presenting the most damaging frequency." (*Id.* at pp. 632-633, fns. omitted.) We agree with Justice Pollak's concurring opinion that no reason exists to assume the jury would simply focus on the most damaging number. "The fact of the matter is that when there is no independent evidence of the perpetrator's race, the chances that the crime scene DNA matches that of another individual varies for individuals of different races. There is no reason to underestimate the jury's intelligence and to assume that when told the different frequencies the jury will not appreciate this element of uncertainty and factor it into its assessment of the weight that should be given to the evidence."

We also agree with Professor Kaye that "because more complete—but unattainable—knowledge [i.e., certainty as to the perpetrator's race or ethnicity] would eliminate some alternatives does not make it wrong to contemplate those alternatives, and there is no inexorable prejudice in providing a range of applicable figures. [¶] . . . The limitations in the databases can be made clear to the jurors, who are in a better position to evaluate the possibility that the match is coincidental if they have a range of the possible frequencies that are consistent with the facts of the case. As such, the exclusionary rule announced in *Pizarro* is baseless and counterproductive." (Kaye, *supra*, 3 Law, Probability & Risk at pp. 216-217, fns. omitted.)

Moreover, as Justice Pollak noted, "as the science underlying DNA comparisons continues to improve, the practical significance of the different racial frequencies diminishes." In *People v. Barney*, *supra*, 8 Cal.App.4th at page 817, the court observed that to say that the frequency of the defendant's DNA pattern was one in 200 million was "tantamount to saying his pattern is totally unique, and thus *only he* could have been the source of the crime scene bloodstains that did not match those of the victim." When the odds move into the billions and, as with the blood on defendant's pants, even trillions, the force of this observation becomes ever stronger. In this case, whether the jury focused on the numbers regarding the two blood samples most favorable to defendant (one in 96 billion and one in 110 trillion) or those most damning to defendant (one in 340 billion and one in 610 trillion) is of little moment. Justice Pollak was correct that "[s]ince there are no more than 7 billion people on the planet, it is rather unlikely, to say the very least, that a jury's evaluation of the significance of the match between defendant's DNA and the crime scene DNA would differ whether the jury focuses on 1 in 96 billion, 1 in 340 billion, or any number in between, as the likelihood of a random match with another person."

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Pizarro II suggested three alternatives to presenting the jury with a range of probabilities: "(1) establish that the perpetrator more likely than not belongs to a particular ethnic population, then present only the frequency in that particular ethnic population; (2) present only the most conservative frequency, without mention of ethnicity; or (3) present the frequency in the general, nonethnic population." (*Pizarro II*, *supra*, 110 Cal.App.4th at p. 633, fn. 85.) For the reasons already stated, the first alternative's limiting the evidence to the frequency of only the most likely population group is counterproductive. Indeed, unless the perpetrator's ethnicity is known *for certain*, the jury should hear a range of possibilities, not merely the most likely one. The second and third alternatives may be acceptable choices in an appropriate case, if such evidence exists, but we see no reason to require one of those alternatives instead of giving the jury a range of possible frequencies.

Defendant also argues that even if we reject the *Pizarro* approach, the evidence here was still improperly admitted because the expert gave the frequency range for only the three most common population groups, rather than *all* possible groups to which the perpetrator could belong. For example, he argues that "the geographical area near the crime scene in Vacaville included significant numbers of Asians, Pacific Islanders, and Native Americans," and thus the range of frequencies should at least have included these groups. He notes that the 1996 NRC Report's recommendation 4.1 states that "if the race [of the person who left the evidence-sample DNA] is not known, calculations for *all* racial groups to which possible suspects belong should be made." (1996 NRC Rep., *supra*, at p. 122, italics added.) We do not believe the National Research Council meant that giving a range of probabilities is impermissible unless the range includes literally all possible population groups. For example, in its comment to recommendation 4.1 in the executive summary, the report suggests that if the race of the perpetrator

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is unknown, the results could be "given for data on whites, blacks, Hispanics, and east Asians." (*Id*. at p. 5.) These four groups would not necessarily include all possible groups.

Although giving results for all possible population groups would be permissible, doing so is not required to give relevance to the range of possibilities. Furthermore, it is not clear whether it is realistically feasible to include all population groups. In the *Soto* case, for example, databases existed for separate subgroups of the Asian population group. The expert witness calculated the probabilities only for the Vietnamese subgroup. (*People v. Soto*, *supra*, 21 Cal.4th at pp. 531-532 & fn. 25.) It is not clear whether the expert could feasibly have provided information about every Asian subgroup or about Asians as a whole, not to mention all other groups or subgroups in the general population. In this case, Criminalist Shea provided information regarding the three most numerous population groups. This made her testimony relevant and admissible.

Of course, defendant was entitled to cross-examine the witness regarding other possible population groups, as he did in this case. When he did, the witness testified that the frequency of other population groups would be comparably small. Moreover, if defendant believed the perpetrator could have been a member of another population group or groups for which the frequency figures would be more favorable to him, he was entitled to cross-examine the witness or present his own evidence in that regard. The fact that defendants might proceed in either fashion does not make the evidence the prosecution presented irrelevant.

III. CONCLUSION

We agree with Justice Pollak's summation: "Thus, there is no cogent reason to preclude testimony of a range of ethnic or racial genetic profile frequencies when the race of the perpetrator is unknown, so long as the data is not presented in a manner that assumes that the race of the perpetrator is the same as

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the race of the defendant. Since the testimony in the present case made no such assumptions, it was relevant, nonprejudicial, and properly received . . . ." (Fn. omitted.)

Accordingly, we affirm the judgment of the Court of Appeal. We approve *Pizarro I*, *supra*, 10 Cal.App.4th 57, and *Pizarro II*, *supra*, 110 Cal.App.4th 530, to the extent they condemn admitting evidence of the odds solely regarding the defendant's population group. But we disapprove of *People v. Pizarro*, *supra*, 110 Cal.App.4th 530, to the extent it concludes that evidence regarding any particular population group is inadmissible absent sufficient independent evidence that the perpetrator was a member of that group.

CHIN, J.

WE CONCUR:

GEORGE, C.J.
KENNARD, J.
BAXTER, J.
WERDEGAR, J.
MORENO, J.
HAERLE, J. *

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* Associate Justice, Court of Appeal, First Appellate District, Division Two, assigned by the Chief Justice pursuant to article VI, section 6 of the California Constitution.

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