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Brave New World of human-rights DNA collection

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Noncriminal DNA databases may serve a societal role in identifying victims of crime and human trafficking. However, how do we safeguard personal privacy of innocent victims and family members?

The rise of DNA databases

As public acceptance of DNA technologies in law enforcement grows, DNA databasing has expanded to noncriminal identification purposes, notably to identify missing persons and human remains [1]. The potential of DNA for humanitarian aid and human-rights purposes, particularly identification of live victims, remains untapped. Routine, systematic databasing of family member profiles of missing persons may assist longitudinal efforts to identify deceased and missing persons. Potentially, DNA databases could further identification of victims of crime, human-trafficking victims, and children placed for illegal adoptions (Table 1). However, the collection of DNA from civilians, especially victims and children, raises profound questions of privacy and protections from abuse of power. Although some have advocated the establishment of national DNA registries for crime resolution and victim identification, others claim that expansive collection of DNA by governments is inherently invasive [2]. Nonetheless, the societal benefit to protect and identify victims of human-rights violations necessitates a dialog on the social boundaries for government-held DNA databases.

The government routinely collects DNA

Many countries have established governmental DNA databases for criminal investigations, immigration procedures, and identification of missing persons. Scholars estimate that, globally, government-operated DNA databases will grow from approximately 30 million profiles in 2011 to 100 million profiles in 2015 [3]. Most profiles are of convicted offenders for crime investigations, but in recent years, jurisdictions have expanded legislation to encompass individuals arrested for certain offenses and immigrant detainees. In general, laws and policies guiding law-enforcement DNA collection aim to balance individual privacy rights against the interest of the government in protecting the public; however, the extent of that balance and its repercussions on privacy and human rights continues to be debated in courts (http://www.scotusblog.com/case-files/cases/maryland-v-king/).

The architecture of DNA databases for crime solving has aided tremendously investigation of unidentified human remains [4,5]. Missing-persons databases house DNA profiles of family members of the missing, of toothbrushes or garments with trace DNA, and of unidentified remains. Many countries require collection of DNA from military personnel for identification of servicemen whose remains may be unrecognizable after battle. To investigate war crimes and postconflict unidentified remains of civilians and misplaced families, several government and independent institutions (e.g., the International Commission on Missing Persons) provide technical assistance in DNA forensics and assist identification of missing persons.

Many countries are incorporating genetic relationship testing into border security measures to confirm the relatedness of petitioning refugees and immigrants [6]. In the USA, authorities do not require DNA collection from petitioners (except in certain refugee cases), but increasingly recommend DNA confirmation of claimed relations. US authorities are developing rapid on-site DNA tests for petitioning refugees and immigrants (http://www.dhs.gov/sites/default/files/publications/privacy/PIAs/privacy-pia-rapiddna-20130208.pdf); however, the USA has not announced any plans to database DNA profiles.

Collecting DNA to identify human-rights victims

DNA technologies applied to identify victims of human-rights violations, such as detecting trafficked persons, is a noble cause, but the intrusion on the privacy of genetic information itself can be considered a human-rights violation (http://www.guardian.co.uk/uk/2008/dec/04/law-genetics). It is vital that these approaches are efficient and affordable, protect individual privacy, and limit abuse of power. The specific application of noncriminal DNA and the population sampled (Table 1) greatly influences the level and types of protection necessary. For instance, programs collecting and storing samples from adopted children may necessitate greater protections than the inclusion of immigrant detainees in a law-enforcement database.

To develop sound approaches, academic centers are working with government authorities to develop DNA programs for identification of victims. One program, DNA-PROKIDS, is profiling DNA from children reported to be trafficked or stolen and from the claimed parents of these children (Box 1) [7]. Another program, the Dallas Prostitute Diversion Initiative (DPDI) collects DNA specimens through law enforcement to facilitate postmortem identification of sex workers likely to become victims of homicide (Box 1) [8]. Both DNA-PROKIDS and the DPDI High Risk Potential Victims Database are collaborations among law enforcement, healthcare providers, academic institutions, and non-governmental organizations (NGOs). Both programs are nascent with ongoing policy development to guide

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Table 1. Applications for the noncriminal collection of DNA

Application	General purpose	Populations potentially collected							Type of database	Mandated?	Program examples
		Civilians	Military personnel	Family members	Children	Arrestees	Immigrants	Refugees			
High-risk victim DNA databanks	Identify victims	X				X			None	No	DPDI High Risk Victim Databank (see Box 1, main text)
Human trafficking	Identify victims	X		X	X	X	X	X	Academic database	No	DNA-PROKIDS (see Box 1, main text)
Intercountry adoption	Confirm biological relations	X		X	X		X		None	In some cases	The US required DNA testing in adoptions from Guatemala of all mothers relinquishing a child for adoption to confirm the biological relation
Missing persons identification	Postmortem identification	X		X	X				Law enforcement database	No	The US Combined DNA Index System (CODIS) is coordinated with the National Missing & Unidentified Person System (NamUs), a separate database with information for missing-person cases, such as age, sex, race, and date and location last seen
Mass disaster and war crimes identification	Postmortem identification	X		X	X				Law enforcement database	No	The International Commission on Missing Persons (ICMP) applies DNA identification to armed conflict, human-rights violations, and natural disasters[a]
Immigration	Confirm biological relations	X		X	X		X	X	None	In some cases	The US Department of State mandates DNA testing in some cases for international refugee cases as part of the US Refugee Family Reunification (Priority Three, or P-3) Program
Military DNA databases	Postmortem identification[a]		X						Armed Forces	Yes	The US Armed Forces DNA Identification Laboratory stores and analyzes specimens from enlisted persons for identification purposes
Law enforcement	Solve future and past crimes					X	X		Law enforcement database	Yes	The US CODIS facilitates sharing of criminal and evidence DNA profiles

[a]The Bob Stump National Defense Authorization Act of 2002 (Pub Law 107-5314, December 2002) also permits use of these specimens for prosecution of felony and sexual offenses.