

Recent statistics from different sources will be presented. The idea is to extend the number of participating centres and institutions in the future and to publish yearly the results in *Twin Research*, the official journal of ISTS.

**061P EARLY REPORT ON THE AVAILABILITY OF ISLAND WIDE TWIN DATA IN THE CENTRAL BIRTH REGISTRATION DEPARTMENT**

Nimali de Silva, Athula Sumathipala, Devaka JS Fernando, Nihal Abeyasingha, Sisira H Siribaddana, DARK Dayaratne, Deepthi De Silva, Narada Warningsuriya  
Correspondence address: National Twin Registry, Department of Medicine, Sri Jayawardenepura University, Nugegoda, Sri Lanka.

Population based twin registers are not common outside Scandinavia, particularly in the developing world. Sri Lanka has a 98% accuracy of birth registration. However only since 1992 these records have been computerized at the Central Birth Registration Department including the details of the twin births. These details are complete only up to 1997.

We scrutinised those computerized records for the year 1992, to look into the feasibility of using it to obtain a twin database. A total of 3189 twins were identified out of 356,842 births registered at the Registrar General Department for the year 1992, giving a twinning rate of 8.93 per 1000 registered births. Higher numbers of twins were registered from major urban centers where the Teaching, Maternal, General, Provincial and Base hospitals are situated. This finding was consistent for the whole country. It was evident that there is a large population based twin database for the whole country from 1992–1997. 1998–2000 data is not yet computerised. To obtain a cohort of twins since birth was a possibility provided that there was a facility to get all the prospective births from now onwards. Support of the statutory services was thus requested and was granted. Therefore all prospective twin births will be directly reported to the Twin Registry, at the time of birth registration. This prospective birth cohort for the whole country will be available for many different projects in the future.

**062S SEX REASSIGNMENT IN MZ MALE TWINS (THE JOHN/JOAN CASE) AND WHAT THIS MIGHT TELL US ABOUT SEXUAL IDENTITY**

Milton Diamond

Correspondence address: University of Hawaii, John A. Burns School of Medicine, 1951 East-West Road, Honolulu, HI 96822, USA.

The so-called John/Joan case has provoked new challenges to the saliency of rearing as being deterministic in one's sexual identification as male or female. Aspects of how these twins interacted and compared and contrasted themselves with each other and with peers provides insight as to some factors in the development of sexual identity. Comparison is made as to how others, for example, transsexual, and intersexed persons, twin or not, and typical singletons, come to understand their identity. Consideration is given to various factors that have been purported to thwart the salient and supposedly "overwhelming and deterministic" forces of rearing are also discussed. Such factors include: maternal and paternal influences, siblings and peers, secrecy as to original sex, indoctrination and brow beating.

**063S TWINS: WHAT THEY MIGHT TEACH US ABOUT THE DEVELOPMENT OF SEXUAL IDENTITY**

Milton Diamond

Correspondence address: University of Hawaii, John A. Burns School of Medicine, 1951 East-West Road, Honolulu, HI 96822, USA.

The question of how individuals come to know that they are male or female has gone through several cycles with either nature or nurture given the nod as to supremacy. From the 1950s to the 1990s the greatest input was attributed to environmental forces, particularly upbringing, as being the most crucial influence in teaching the child it is either a boy or a girl destined to grow to be a man or woman. The later half of the decade of the 1990s, however, has dramatically shifted the thinking to give greater weight to intrinsic biological forces as being deterministic.

One of the most important cases in this debate has been that of the so-called John/Joan twin. Here was an XY individual raised as a girl from about a year in age, sans penis, scrotum and gonads and with preliminary surgery to fashion a vulva. From the age of 12 the twin was given estrogen medication to foster female pubertal development. Despite this treatment the twin came to identify as a male and eventually, at the age of 14, rejected his living as a girl. This case will be discussed. Also to be discussed are other cases where twins in particular, but siblings and peers in general, are seen as important factors in how individuals come to recognize their biological sex and the social gender that best suits them. A mechanism, incorporating both intrinsic and extrinsic factors attempts to explain how this comes about.

**064S GENE-ENVIRONMENT INTERACTION IN ALCOHOL USE AND ABUSE: DATA FROM FINNISH TWIN STUDIES**

Danielle M. Dick, Richard J. Viken, Jaakko Kaprio, Lea Pulkkinen, & Richard J. Rose

Correspondence address: Indiana University, Dept. of Psychology, 1101 E. 10th St., Bloomington, IN 47405

Behavior genetic studies were heavily criticized in the past for their failure to include environmental measures; this criticism is no longer warranted, as genetically-informative studies are increasingly including environmental measures, and advances in biometrical modelling allow for the incorporation of specific environmental variables. With data from two population-based studies of Finnish twin adolescents, we have been exploring the effect of a variety of environmental influences on alcohol use/abuse and related phenotypes, and the interaction of these environments with genetic influences. In successive analyses, we illustrate the impact of various environmental factors, including socio-regional and community-level influences, home environment, and peer influences. Each of these environmental variables also illustrates a different way that the environment can interact with genetic factors. We document the presence of community-level environmental influences, and demonstrate socio-regional moderation of influences on alcohol use, with the importance of genetic and environmental influences varying more than five-fold between environmental extremes. Parental monitoring and home atmosphere contribute additively to adolescent behavior problems, while peers' alcohol use exhibits a more complex, interactive relationship with self-reported alcohol use. Thus, in a series of quantitative genetic analyses, we explore various environments involved in alcohol use and related phenotypes, and the manner in which these environments act and interact with genetic predispositions.

**065P TWIN STUDY OF MAMMOGRAPHIC BREAST DENSITY FOR AGE AS A RISK FACTOR FOR BREAST CANCER**

Gillian S. Dite, Norman F. Boyd, Margaret R.E. McCredie, Dallas English, Graham G. Giles, John L. Hopper

Correspondence address: Centre for Genetic Epidemiology, Carlton, Vic 3053, Australia

The proportion of dense breast tissue for a woman's age (breast density for age) has been found to be a strong risk factor for breast cancer by prospective case-control studies that matched for age nested within cohorts of women attending mammographic screening programs. We have digitised mammograms from both members of 617 female pairs of Australian twins aged 40 to 75 years (349 MZ, 268 DZ), and used a computerised algorithm to quantify breast density. We also collected information on demographic and potential determinants of breast density by an interviewer-administered questionnaire. Breast density was independent of age up to 50 years, but decreased in the next decades. The correlation in age-adjusted logit breast density was 0.67 (*s.e.* = 0.05) in MZ pairs and 0.27 (*s.e.* = 0.06) in DZ pairs. Under the usual assumptions of the classic twin model, this would suggest that genetic factors explain the majority of variation in this risk factor for breast cancer. Given the inter-quartile risk of disease associated with age-adjusted breast density is 3- to 5-fold, this would translate into an increased risk of breast cancer due to having an affected twin of 1.2-fold within MZ pairs, and 1.1-fold within DZ pairs. That is, breast density for age could explain about 10–20% of familial aggregation of the disease on a population basis, similar to the proportion attributed to mutations in BRCA1 and BRCA2. Within-pair analyses that naturally match for age showed a strong association of breast density with weight, and a clear linear association with number of live births. Bivariate analyses of cross-twin correlations suggested that about half the within-person correlation between breast density for age and weight could be due to genes that influence variation in both traits.

**066S MULTIPLE BIRTH CHILDREN'S LANGUAGE AND LEARNING ENVIRONMENTS**

Barbara Dodd and Sandra McMahon

Correspondence address: Department of Speech, University of Newcastle, UK

Studies of the speech and language acquisition of multiple birth children (MBC) have most often been used to estimate the contribution of genetic factors to development by comparing monozygotic and dizygotic siblings. There is, however, another way of using the evidence. Rearing more than one child of the same age in the same family, allows observation of the influence of specific language learning environments. The data suggest that there are differences between twins' and triplets' speech and language acquisition in terms of the aspects of language that are either advantaged or disadvantaged. The twin situation seems to enhance language use but place phonological acquisition at risk for disordered development, with consequent implications for literacy. In contrast, triplets have particular and persistent difficulty with pragmatic aspects