IV. School Drug Testing in Tai Po: the Process

8. Overview

8.1 The Project Team is aware that school drug testing is highly controversial, with proponents citing prospects and overseas evidence of positive impact on reducing abuse of drugs by students on the one hand, and opponents raising concerns involving practical, legal, ethical and educational issues and overseas evidence that school drug testing has not been proved effective. Nevertheless, what is heartening to note is that both proponents and opponents share the same common ground, namely adequate actions must be taken promptly to abate the rising trend of drug abuse by children and adolescents. Indeed, during discussions with a number of principals, teachers, social workers and medical practitioners throughout the entire research study, they were of the view that the launch of the Scheme had helped galvanized cooperation between education, social work and medical professions as well as members of the community in their concerted efforts to help students stay away from drugs and those who had abused drugs to quit drugs.

8.2 The Project Team is also aware that the Scheme is a new initiative, over and above current measures on preventing and treating drug abuse and rehabilitating drug addicts. It is only one component of the multi-pronged approach of government in combating drug abuse among secondary school students. There are a host of educational and preventive measures as well as intervention programmes being organized by schools, NGOs and community networks.

8.3 The Project Team noted that in designing the Scheme, parties concerned, including the 23 secondary schools in Tai Po, had made reference to practices in other countries. For example, in the US, when students were tested positive, most school districts required students' parents or guardians to meet school officials (88%), required the students to participate in an education, counselling or treatment program (61%) or suspended students from school athlete teams (66%). Most school districts had services provided to students tested positive, including professional counselling for drug abuse problems (87%) or referrals to counselling

services (92%).[104]

8.4 Furthermore, in a review of 52 schools in New Jersey, researchers noted that random student drug testing was only part of a comprehensive prevention strategy of schools, which included drug and alcohol prevention programs. For US public school districts with random selection drug testing programs, schools had to adhere to specific requirements of student confidentiality as dictated by The Federal Privacy Act (P.L.93-575), The Federal Alcohol and Drug Abuse Act (P.L. 92-282) and Federal Regulation (42 CFR-Part 2). Students were not identified by name, social security number, or student identification number for drug-test purposes. All drug testing records were maintained separate from permanent records and had to be destroyed upon graduation. School district officials might not share information of students screened positive with local law enforcement agencies. Information on drug-test results might only be given to the students and their parents. Only individuals authorized to administer the program were permitted access to drug-test results. [105] However, contrary to federal guidelines, less than half of school districts still notified law enforcement officials (45%) or suspended students from school (31%).[106]

8.5 Based on a review of US court cases up to 2002, researchers suggested that a school drug testing policy should comprise at least (1) rationale for testing; (2) statement of the substance(s) to be tested; (3) requirement of a consent form; (4) procedure for determining how students would be selected randomly; (5) procedure to be followed in collecting sample for drug testing; (6) the tests to be used; (7) report of positive test results to appropriate school officials; (8) defenses available to students testing positive; and (9) penalties for students testing positive. [107]

8.6 In this chapter, study findings related to implementation of the Scheme in Tai Po, including coverage of the Scheme and views of stockholders on the

104 Ringwalt, Chris, et al (2008), "Responses to positive results from suspicion-less random drug tests in US public school districts", in *Journal of School Health*, 79(4): 177 – 183.

105 Edwards, C E (2008), "Student drug-testing programs: do these programs negatively impact students?" a paper prepared for the Student Drug-testing Coalition.

106 Ringwalt, Chris, et al (2008), "Responses to positive results from suspicion-less random drug tests in US public school districts", in *Journal of School Health*, 79(4): 177 – 183.

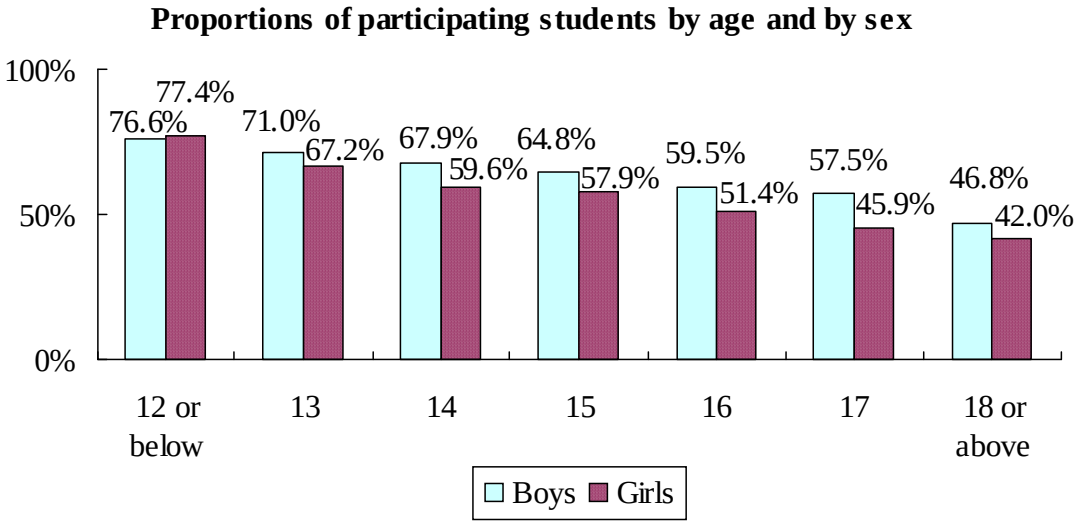
107 Mawdsley, Ralph D (2002), "Legal issues involving random drug testing: an American perspective", in *Australia and New Zealand Journal of Law and Education*, 7(2): 161 – 177.

preparatory work for the Scheme and the drug testing process, are presented and discussed. Information used in the study is based on data gathered from the December 2009 survey and June 2010 survey as well as views expressed by stakeholders during focus group discussions and in-depth interviews.

9. Coverage of the Scheme

9.1 More than 12,400 students joined the Scheme. The December 2009 survey showed that by end 2009 about 61.5% of them indicated that they and their parents had given consent to participate in the Scheme. 37.5% did not participate in the Scheme and 1.0% did not provide any information. Since the announcement of the participation rate in December 2009, 68 more students and their parents joined the scheme, while seven students and their parents withdrew from the scheme. [108]

9.2 A higher proportion of boys (63.5%) participated in the Scheme as compared with girls (57.0%). Younger students were more likely to participate in the Scheme, with the participation rate falling steadily with age. For instance, while 77% of students aged 12 or below participated in the Scheme, only 42% - 47% of students aged 18 or above participated.

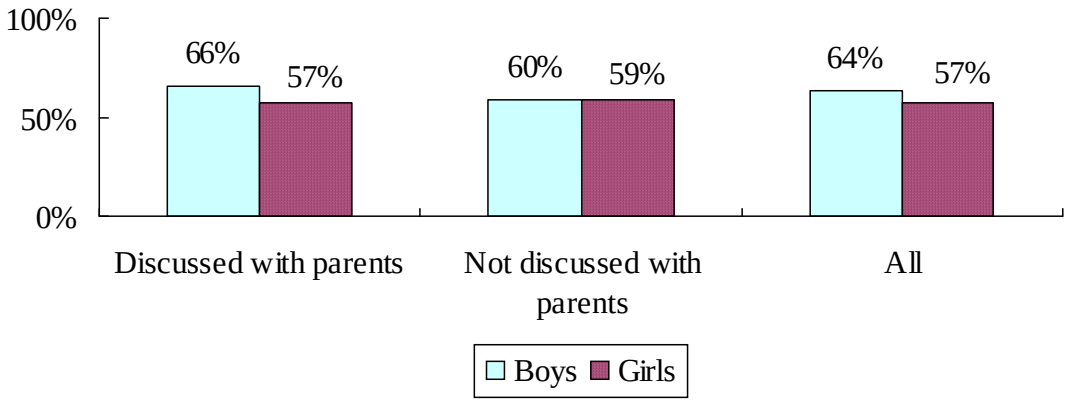


108 Source: Narcotics Division, Security Bureau.

http://www.info.gov.hk/gia/general/201006/28/P201006280169.htm retrieved on 29 June 2010.

9.3 In the Scheme, both parents and students are required to sign the consent forms for participation in the Scheme. It is believed that in doing so, parents and their children will have the opportunity to discuss the pros and cons of the Scheme in general and the risks of their children taking or being exposed to drugs in particular. The December 2009 survey showed that about 72% of students had discussed with their parents on whether they should participate in the Scheme and the percentage was higher for girls (78%) than for boys (66%). For boys who had discussed with their parents, a higher proportion of them (66%) participated in the Scheme, as compared with those who had not discussed with their parents (60%). For girls, on the other hand, a slightly lower proportion of those who had discussed with their parents (57%) participated in the Scheme, as compared with those who had not discussed with their parents (59%).

Proportions of participating students by whether they had discussed with their parents and by sex



9.4 The June 2010 survey showed that among students who had participated in the Scheme, more than half of them jointly decided their participation with their parents. It is also of interest to note that 28% of these students decided to participate in the Scheme on their own, which is lower than the corresponding percentage for students not participating in the Scheme (33%). Seen in the context that only 70% of students had discussed with their parents whether to participate, the survey findings indicate that more efforts are required to promote parental involvement in the Scheme in particular, and anti-drug education for children in general.

	Dec 2009 survey %	Jun 2010 survey %
Have you participated in the trial scheme of school drug testing?		
Yes, who decide to participate in the trial scheme?	61.2	64.1[109]
My parents and I	-	*57.6*
Only I	-	*27.9*
Only my parents	-	*12.3*
Refuse to answer	-	*2.2*
No, who decide not to participate in the trial scheme?	37.5	34.7
My parents and I	*56.5*	*55.8*
Only I	*33.0*	*33.3*
Only my parents	*7.0*	*7.1*
Refuse to answer	*3.5*	*3.8*

Observations

9.5 The Project Team is of the view that it is difficult to say whether this level of participation in the Scheme is high or low, given that it is the first time drug testing is introduced to local schools and there will inevitably be uncertainties and anxiety on both parents and students. Nevertheless, it is heartening to see that more than half of students have voluntarily given their consent to participate in drug testing, signaling that they have the determination to stay away from drugs. In particular, for those in the lower grades who are more likely to be at risk, a much higher proportion of them have agreed to participate in the Scheme. This is, in the view of the Project Team, a very encouraging sign.

9.6 The survey findings showed that the majority of students had discussed the Scheme with their parents. The Project Team believes that this will invariably help raise the awareness of parents of drug abuse problems among students and encourage more frequent and open discussions in the family. Furthermore, giving

109 The figure derived from the 2010 post-survey is higher than that of the 2009 pre-survey mainly because the post-survey does not cover Secondary 5 and 7 students whose participation rates were lower than those of the lower forms.

consent by students to participate in the Scheme is an educational process through which students learn how to weigh the pros and cons of the Scheme, balance their interests, expectation of schools and parents and the interest of school community to which they belong, and make a decision on their own and see that their decisions are respected by schools and parents who may have different views. The survey findings also point to the need for stepping up efforts to promote parental involvement in the Scheme and in anti-drug education for children in general.

10. Preparations for the Scheme

Briefing of parents

10.1 Before the launch of the Scheme, a number of briefings were held for parents of students studying in the 23 secondary schools in Tai Po. According to the June 2010 survey findings, nearly all principals were of the view that the briefings had enhanced the knowledge of parents on the harmful effects of drugs to students and their understanding of the purposes and operations of the Scheme. Their concerns on the Scheme were also adequately addressed.

	% of strongly agree or agree
Enhance knowledge of parents on harmful effects of drugs to students	95.7
Make parents understand the purposes and operations of the Scheme	100.0
Respond adequately concerns of parents on the Scheme	100.0

Briefings of teachers and students

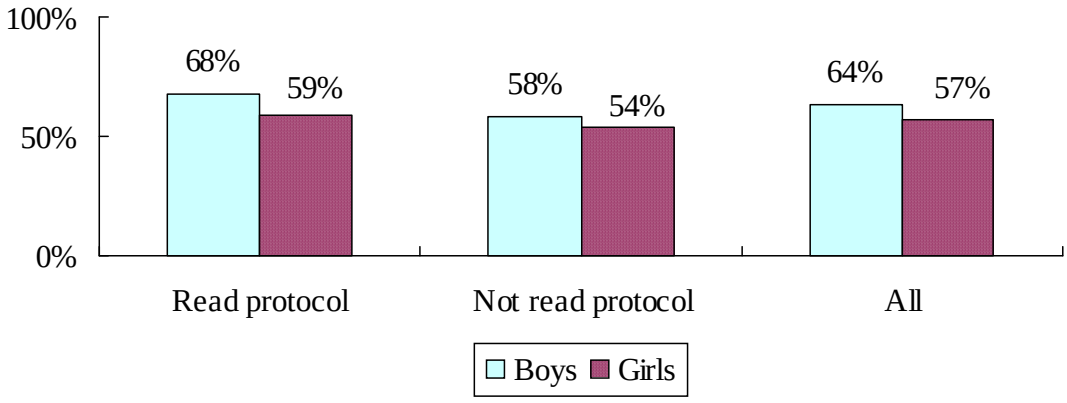
10.2 A number of briefings were also held for teachers and students of the 23 secondary schools in Tai Po. The June 2010 survey showed that all principals were of the view that the briefings had enabled teachers to understand the purposes and operations of the Scheme. All principals were also of the view that briefing sessions for students had enhanced students' knowledge of the harmful effects of drugs, made students understand the purposes and operations of the Scheme and responded adequately to concerns of students on the Scheme.

	% of strongly agree or agree
Enhance knowledge of students of harmful effects of drugs	100.0
Make students understand the purposes and operations of the Scheme	100.0
Respond adequately concerns of students on the Scheme	100.0

Students' understanding of the Scheme

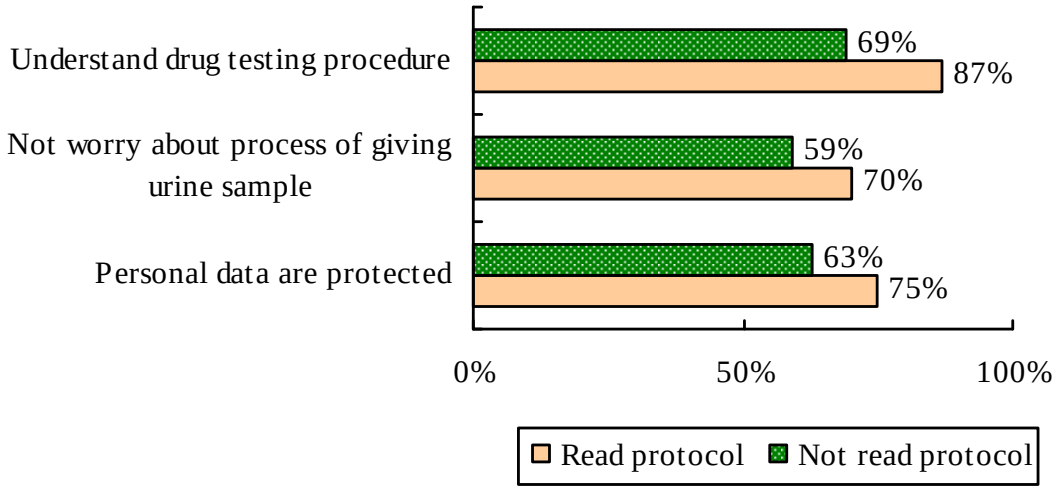
10.3 On the part of students, the December 2009 survey showed that 58% of students had read the protocol of the Scheme. The percentage was slightly higher for girls (60%) than for boys (57%). A higher proportion of students who had read the protocol (68% for boys and 59% for girls) participated in the Scheme, as compared with those who had not (58% and 54% respectively). Apparently, the protocol has helped raise students' understanding and acceptance of the Scheme.

Proportions of participating students by whether they had read the protocol and by sex



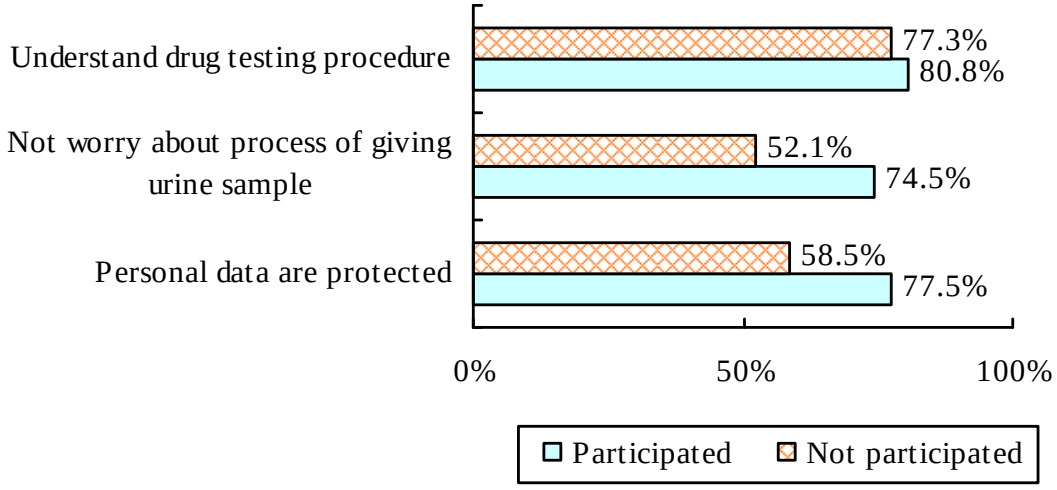
10.4 Most students indicated that they understood the drug testing procedure (79%) and believed that their personal data would be protected (70%). More than half were also not worried about the process of giving their urine sample (66%). It is not surprising to note that the percentage was higher for those students who had read the protocol as compared to those who had not.

Proportions of views of students on the operation of the Scheme by whether they had read the protocol



10.5 In addition, for those students who had participated in the Scheme, a much higher proportion of them were not worried about the process of giving urine sample (75%) and believed that their personal data would be protected (78%), as compared with those who had not participated. A higher proportion of them (81%) also understood the drug testing procedure, as compared to those who had not participated (77%).

Proportions of views of students on the operation of the Scheme by whether participated in the Scheme, December 2009



Observations

10.6 Apparently, the Scheme has been carefully planned, with every effort made to ensure that teachers, parents and students fully understood the purposes and operations of the Scheme and parents' and students' concern on the Scheme carefully addressed. Given the number of teachers, students and parents involved, the Project Team considers completing the preparatory work including consultation with stakeholders within a short span of several months' time is an extraordinary achievement, bearing in mind that schools are already heavily engaged, especially at the start of the school year, in carrying out a number of new, major educational initiatives such as the New Senior Secondary Curriculum and the ongoing curriculum reform, and the fine-tuning of the medium of instruction. This cannot be possible without the commitment and dedication of principals of the 23 secondary schools in Tai Po, driven by their belief and conviction that prompt and decisive actions have to be taken by schools to help students stay away from drugs. Indeed, getting all 23 secondary schools to agree and act together, for the benefits of their children, is already a remarkable accomplishment.

10.7 As discussed above, for students who had not participated in the Scheme, a lower proportion of them were not worried about the process of giving urine samples and believed that their personal data were protected, as compared with those who had participated. It seems that worries over the process of giving urine samples and doubt on whether personal data are protected are likely to be factors affecting students' willingness to participate in the Scheme. It would thus be advisable to step up education and publicity on the Scheme to help remove any worries or doubts students may still have on the Scheme.

11. The drug testing process

Protocol on drug testing

11.1 A set of protocol on the Scheme was drawn up, spelling out clearly the objectives and guiding principles of the Scheme, the roles of concerned parties, procedures to be taken in conducting drug tests including the random selection of students, liaison between schools and the SDT team, collection of urine samples from students and notification of test results to parents, provision of support

services to students tested positive, the handling of self-referrals, refusals and withdrawals of consent, and protection of personal data privacy. In designing the entire implementation procedure, the need to protect confidentiality of personal information was accorded very high priority. The Government seconded two experienced executive officers, who were designated as "Project Officer" under the Scheme, to the Home Affairs Department to oversee the implementation of the Scheme and to advise schools on matters related to protection of confidential information and personal data.

11.2 By 28 June 2010, a total of 2,495 students were randomly selected for the screening test, representing about 20% of those who have participated in the Scheme. Among these students, 1,975 took the test and no confirmed positive case was found.[110] Given that it took on average about 15 minutes to conduct drug test on one student and that drug testing had to be conducted during class the duration of which ranged from 35 minutes to 55 minutes, outside examination times, the SDT indeed had a busy time visiting schools to complete drug testing on nearly 2,500 students in less than 6 months' time.

11.3 Members of the SDT team pointed out that in conducting drug tests, utmost care had been taken to ensure that students' personal data were protected, while proper records on the test results had to be kept. For example, in communications with schools, students were identified through the use of code numbers and were counter-checked by schools to ensure that the students sampled for drug testing were correctly identified and asked to undertake the drug tests. Before giving their urine samples, the students were briefed on the purposes of test, the procedures involved and the right to withdraw from the Scheme or refuse taking the test. Every effort had been made to ensure that the students felt comfortable with the entire drug testing process. According to views of the SDT team, participating students were positive about the Scheme and co-operative in drug testing.

11.4 During discussions with students, feedback from students was also very positive. They generally felt comfortable with the drug testing process and were not embarrassed. Indeed, the June 2010 survey showed that the majority of students understood the drug testing procedure (76%), were not worried about the process of giving urine samples (74%) and believed that their personal data were

110 Source: Narcotics Division, Security Bureau.

http://www.info.gov.hk/gia/general/201006/28/P201006280169.htm retrieved on 29 June 2010.

protected (76%). The survey also showed that students had better understanding of the drug testing procedures, were less worried about the process of giving urine samples and were more confident that their personal data were protected, after having taken the drug tests.

11.5 Partly because drug testing was conducted in an efficient manner, causing minimal disruption to school activities, most teachers and students interviewed by the Project Team indicated that they did not even notice that the SDT team had visited their schools and conducted the drug tests. The June 2010 survey findings showed that among the 15% of students who had been randomly sampled for and had taken the drug tests, the great majority (88%) were satisfied or very satisfied with the drug testing arrangement. In addition, feedback from parents was also highly positive. According to the 2010 survey, among the 18% of parents whose children had taken the drug tests, the great majority (90%) were totally not worried or not worried that drug testing would have negative impact on their children.

Keeping of samples and records

11.6 According to the protocol on drug testing, non-essential specimens (i.e. specimen with negative screening test result) will be immediately disposed of by the SDT team. For positive cases, the same urine specimens are sent to the Government Laboratory for confirmatory tests. No personal identifier will be attached to the specimen in order to ensure confidentiality and privacy. Normally, the confirmatory test will take about five working days and the test results will be available for collection at the Government Laboratory by authorized staff of the SDT team and via secure communication to the project officer. The specimens will be destroyed by the Government Laboratory personnel in 5 working days after completion of analysis. If the identified student and/or his parent/guardian insist on obtaining a second test by another competent laboratory to refute the positive screening test result, they may do so at their own expense and should inform the school principal within three working days from the screening test. Up to end June 2010, there were only four false-positive cases and no second laboratory test was requested by parents.

11.7 As regards the keeping of records of students related to the Scheme, it is noted that the consent forms of students who have not given consent to participate in the Scheme will be destroyed after verification. For students who have agreed to

participate, their consent forms will be kept by schools concerned for the purposes of the Scheme. The list of students participating in the Scheme will also be kept by the SDT team using secured USB devices. From discussions with principals and members of the SDT team, the Project Team was given to understand that personal data collected from students for the purposes of the Scheme were kept either in password protected computers (standalone computers in most cases) or in securely locked cabinets. The Project Team was also given to understand the records would be destroyed upon completion of the Scheme, though the exact date had not yet been fixed. In short, every step has been taken to protect the personal data of students participating in the Scheme.

Venue for drug testing

11.8 The physical environment and facilities available in different schools are different. To safeguard data privacy of students taking the tests, schools had painstakingly chosen collection sites for drug testing that were situated in secluded locations of schools, such as the changing rooms behind the stage of school halls or teacher rooms in a separate block of the school buildings away from the classroom block, though the locations chosen might not be most ideal, given that school premises were generally not very large. Where possible, students were asked to enter and leave the collection site through different staircases such that students going to the collection site for drug testing would not meet those leaving the site after the drug tests. Toilet or restroom facilities were also available in the collection sites such that students would be asked to produce their urine samples with individual privacy.

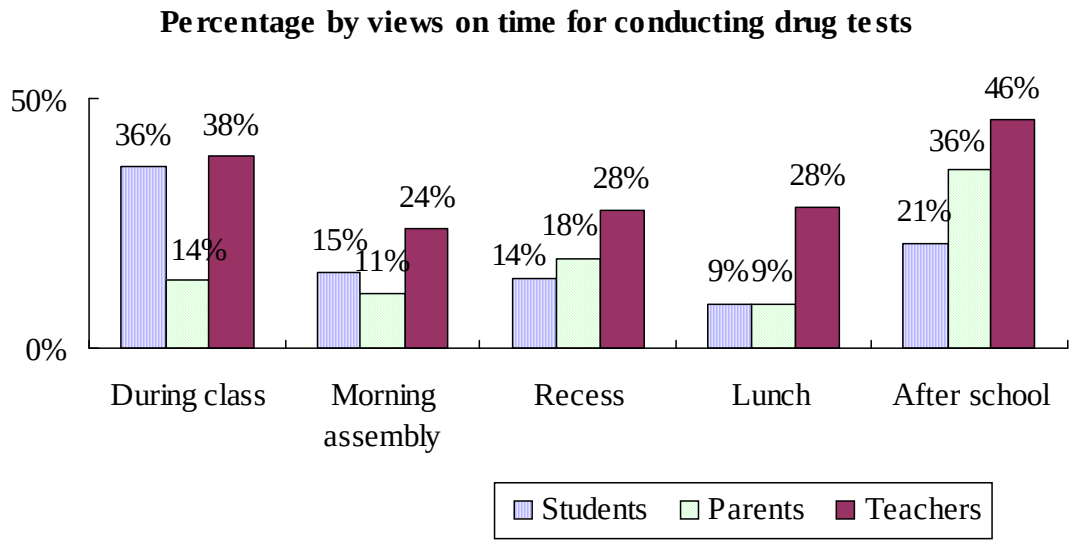
11.9 During discussions with students, most of them were happy with the locations of the collection sites. Nevertheless, a few grumbled that they had to walk quite a distance from the classrooms to the collection sites, or that they had to walk across the school playground to the collection sites and were thus seen by other students attending physical education. Admittedly, it is difficult to find a collection site that is both convenient to students taking the drug tests and located in secluded corner of the school not easily seen by other students.

Time for conducting drug tests

11.10 For the Scheme, drug tests were conducted during class. Principals of schools concerned would choose periods when there was no examination or test and had avoided periods for important subjects like languages. From discussions with principals and teachers, most of them believed that the impact on students who were asked to leave the class for about 15 minutes for drug testing was minimal. The main reason for conducting drug tests during class was to ensure that students going to the collection site for drug testing would have the least chance of being seen by other students. Conducting drug tests during recess would significantly limit the number of students who could be tested and increase the chance of students sampled for drug tests being seen by other students. Conducting drug tests after school would affect extra-curricular activities of students.

11.11 Views of students were quite diverse when they were consulted on their preferred time for conducting drug tests during focus group discussions with them. Some did not mind leaving the class for about 15 minutes, especially during lessons they did not like much, while some complained that they had to miss part of the lessons, especially for those they liked most. Some believed they could easily catch up after having left the class for about 15 minutes, while others were worried that they might have missed a lot. Some students suggested that drug testing should be conducted outside school hours; while others were not in favour of the suggestions for fear that doing so would affect their extra-curricular activities which were also part of learning and teaching.

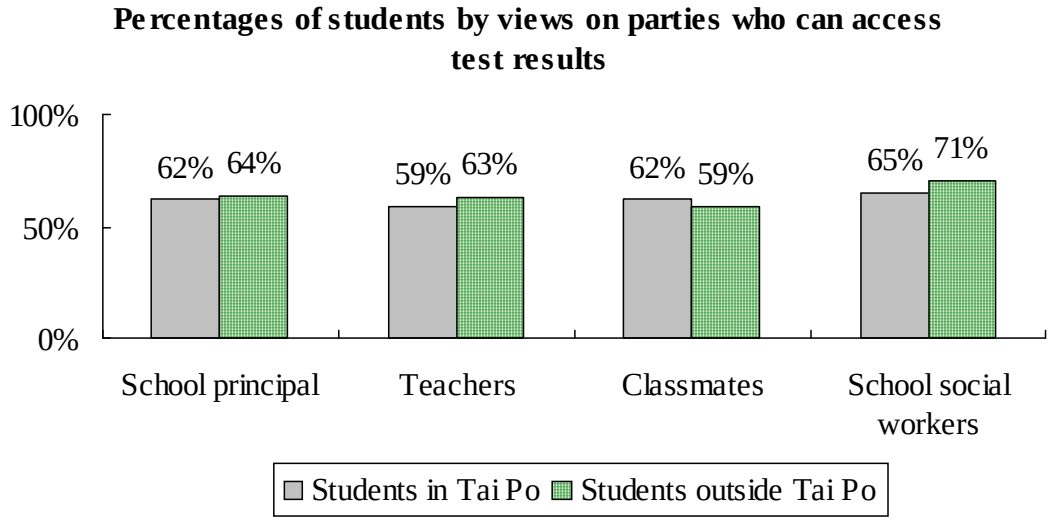
11.12 Findings of the June 2010 survey, as depicted in the chart below, also showed that views of students, parents and teachers in Tai Po were quite divided. Nevertheless, it may be worth noting that a higher proportion of parents and teachers preferred the drug testing be conducted after school hours, as compared with other choices. For students, on the other hand, a higher proportion preferred conducting drug testing during class.



Parties to be informed of the test results

11.13 In the Scheme, apart from the students and their parents, schools were also informed of the test results by the Project Officer. The Project Team has consulted school principals and teachers on whether they should be informed of the drug test results. Most principals and teachers believed that they could provide guidance and assistance to students and coordinate intervention and treatment provided by social workers and other professionals if schools were informed of the drug test results. On the other hand, some social workers were worried that schools might be prejudiced against students found to have abused drugs or might even indirectly force students to leave schools through various means. Letting schools know drug test results might also discourage students from participating in the Scheme.

11.14 The survey findings showed that more than half of students did not mind letting their school principals, teachers, classmates and school social workers know about their drug test results. The Project Team believes that since most students have not taken drugs or are confident that their schools would try to help those who have abused drugs, and hence they do not mind letting their school principals, teachers and school social workers know their drug test results.



11.15 The Project Team believes that schools play an important role in providing guidance and assistance to students in need, including those who have abused drugs. Therefore, it is in the interest of students and schools to have access to the drug test results, so that they could provide timely guidance and assistance to students, and coordinate treatment and intervention efforts of social workers. While the concerns expressed by social workers are not unfounded, a more positive approach should be to take all precautionary steps necessary to ensure that schools will not discriminate against students who have abused drugs, rather than keeping schools away from taking up a useful role in providing support services available to students. As emphasized by several social workers interviewed, maintaining linkage between students who have abused drugs and their schools is vital to any successful intervention and treatment programme. Besides, given that both school staff and social workers care about the well being of students, efforts should be made to further increase mutual trust and foster closer cooperation between principals and teachers on the one hand and social workers on the other.

Observations

11.16 Although the Project Team did not have a chance to observe the drug testing process, given the need to protect the confidentiality of students taking part in the drug tests, the Project Team was impressed by the highly professional manner in which drug testing was planned. From documents examined by the Project Team and views of principals, teachers and students expressed during in-depth interviews and focus group discussions, the Project Team is of the view

that the entire drug testing process has been meticulously planned and implemented with utmost care and caution in accordance with the protocol. When the Scheme was first announced in 2009, fear had been expressed that sensitive personal data on students could be inadvertently lost or revealed to unauthorized persons. Concerns were also raised over possible embarrassment caused to students when asked to produce their urine samples. Apparently, a professionally conducted drug testing scheme has addressed such fears and concerns.

11.17 Schools are used to deal with personal data of students and always strive to handle such data properly. Teachers are also aware of the need to protect the personal data of students. From discussions with principals and teachers, it appears that the Scheme has sensitized them of the requirements under the Personal Data (Privacy) Ordinance and the potential pitfalls if personal data of students are not handled properly. Before and during the implementation of drug testing, the Project Officers have offered schools support and advice on practical issues related to the protection of personal data, which go a long way to ensuring that the Scheme is implemented smoothly and raising the awareness of both teachers and other school staff on measures required to be in place to safeguard students' personal data.

11.18 Given most school campuses in Hong Kong are not large, it is exceedingly difficult in practice for arranging students to participate in drug testing, or indeed any school activities, without being noticed by other students. The Project Team believes that rather than trying to relocate the collection site say further away from the classrooms, causing much inconveniences to the students concerned and affecting the efficient operation of the Scheme, it may be desirable to devote efforts to change students' perception of the Scheme and to ensure that participation in the Scheme or not will not have any labelling effects on the students concerned.

11.19 Apparently, students, teachers and parents who prefer drug testing not to be conducted during classes are of the view that asking students to leave the class for about 15 minutes will have an adverse impact on learning and teaching on the part of the students. Choosing other time slots may also raise similar concerns among teachers, students and parents. The Project Team notes that schools outside Tai Po that have introduced drug testing have opted for different arrangement (e.g. conducting drug testing during morning assembly). The Project Team believes that while the choice of the time for conducting drug tests should be left to

individual schools to decide, following a school-based approach, in consultation with stakeholders concerned, a more productive approach should be to explore ways and means to streamline the process of drug testing, such that it will cause minimal disruption to learning and teaching, regardless of whether it is conducted during class or after school.

12. Choice of drug testing methods

The state of technology

12.1 There are different methods of drug detection and screening, ranging from the use of questionnaires administered with pen and pencil screening forms, or completed online, interviews and clinical observation in say a clinical interview assessment, independent tests of body fluids (e.g. saliva, sweat, urine, breath or blood) or tissue (e.g. hair, skin, nails), or other forms of detection and screening that do not involve assessment of an individual per se but assessment of their materials such as clothes, bags, belongings, using techniques such as sniffer dogs, scanning equipment or other forms of non-invasive mechanical detection devices. [111]

12.2 In Australia, drug testing is a two-stage process, involving an initial screen to detect the presence of a drug, followed by a confirmatory test to assess (confirm) the accuracy of the initial results by a validated analytical procedure using mass-spectrometry techniques. For initial screening, on-site screening with Point of Collection Test (POCT) devices or laboratory analysis may be used. As most POCT devices use immunoassay techniques and are less reliable and accurate than laboratory analysis, POCT devices are useful as initial screening tests only.

12.3 The advantages of POCT devices are that they are less expensive and easier to be administered. Studies conducted in Europe showed that several POCT urine testing devices met the evaluation criteria of greater or equal to 95% accuracy, greater or equal to 90% sensitivity and greater or equal to 90% specificity, which are commonly used as minimum acceptable standards.

111 Materials presented in this section are based on Australian National Council on Drugs (2008), *Drug testing in schools: evidence, impact and alternatives* and Wong, Raphael C and Tse, Harley Y (2005), *Drugs of Abuse: bodily fluid testing*.

However, there was wide variability between different devices and drug types. For example, the accuracy for amphetamine detection varied from 66 to 100 per cent, sensitivity from 16 to 100 per cent, and specificity from 56 to 100 per cent across urine devices. For cannabis, accuracy varied from 85 to 97 per cent, sensitivity from 70 to 99 per cent, and specificity from 90 to 100 per cent across urine devices.

12.4 For tests of body fluids, there are also a number of different drug testing methods. More than one choice of test kits is also available for each kind of body sample (e.g. there are quite a number of test kits for urine). Some of the tests are intimate while others are not. Some tests such as hair test and blood test may be repugnant to students as they may affect their appearance or cause pain. The choice of testing methods depends on such factors as cost, specific drugs to be detected, detection windows, accuracy, equipment requirement, sensitivity, limitations, etc.

12.5 As regards laboratory tests, blood testing is considered the 'gold standard' for accuracy and reliability, but it may not be suitable for use in school-aged children. However, drug levels found in blood are often quite low. The analysis of drugs in blood is also time-consuming. Furthermore, blood testing is an invasive medical procedure that can pose a health and safety risk to both donor and collector. There is much greater risk of transmission of infectious disease through handling of blood specimens than other bodily fluids such as urine. Apart from blood tests, there is a range of other different types of tests that may be suitable for the detection of drugs used by school-aged children including urine, saliva, hair and sweat tests.

12.6 Urinalysis is the most frequently used and most researched type of drug test currently conducted in workplace, clinical and custodial settings. There is an extensive body of research addressing the detection of drugs and their metabolites in urine specimens. There are a wide variety of immunoassays available for detection of most common drugs of abuse or their metabolites in urine. It is the least expensive of all drug test types, whether conducted using a POCT device or in the laboratory. For most drug types, it can detect use that has occurred up to several days prior to the test. One exception to this is cannabis use, the window of detection can be up to several weeks for regular use. One limitation of urinalysis is the difficulty in correlating urine drug or metabolite levels with likely dosing and likelihood of impairment.

12.7 However, the supervised collection of urine can be an invasive and disturbing process. One issue is the potential invasion of privacy involved in specimen collection. Dilution, adulteration or substitution of urine samples is more easily achieved compared to other specimen samples, although it could be minimized through administrative measures, e.g. rooms for taking urine samples without sources of diluents such as tap water or flush water; and the validity of the sample can also be tested for dilution and adulteration through the use of commercially available test kits. It can be time-consuming if the donor cannot readily provide a sample or is required to produce a second sample.

12.8 Saliva testing is a relatively new technology that is increasing in popularity as a less invasive form of testing compared to urinalysis. Specimen is available immediately and collection of sample is more easily supervised which reduces the opportunity for specimen substitution, dilution or adulteration. However, it may be difficult to collect sufficient sample quantities for subsequent confirmatory analysis or retesting. The window of detection for saliva tests is much shorter (12–24 hours) than for other test types. There are possibilities of oral contamination (e.g. eating or drinking) adulterating or diluting the sample. Hence donors may need to be supervised for up to 30 minutes prior to sample collection. Furthermore, POCT available for oral fluid test is limited and is only confined to certain drugs of abuse.

12.9 While hair analysis is not new, hair testing to detect drug use is not used as frequently as urine or saliva analysis. While the hair analysis technique is relatively new compared with that of urinalysis, research on hair analysis is increasing. It is relatively non-invasive and has less sample storage and transportation problems compared to urine and saliva specimen samples. Some claim that by analyzing segments of the hair shaft, a time profile of drug use may be obtained, though others challenge the scientific validity of such segmental analysis. In addition, the main advantage of hair analysis is the relatively long window of detection offered. Drugs have been demonstrated to remain in hair for extended periods of time and current hair testing protocols examine segments of hair representing about 3 months of growth (as head hair typically grows approximately 1 cm per month). On the other hand, it appears that the shortest time it takes for drug use to be detectable in human hair varies from one to seven days [112] according to drug type. Thus, it cannot detect recent drug use (i.e. use in

112 This, however, requires plucking of hair so that the hair follicle is also taken. This may be considered

the hours/days prior to the test). It is also difficult to detect low levels of drug use.

12.10 However, hair testing can be easily evaded (e.g. shave hair) and the use of hair treatments and differences in hair colour and hair structure may make test results difficult to interpret. Hair is also susceptible to environmental or passive drug contamination. Though issues related to environmental contamination and the possibility of hair-colour bias (with many drugs binding preferentially to dark-pigmented hair over fair-coloured hair) have been reasonably well investigated, with some laboratories claiming that they can distinguish between actual drug use and environmental contamination by comparing the levels of drugs found in preliminary wash solutions and those found in actual hair analysis, these issues appear to remain subjects of controversy. Finally, hair analysis is more expensive compared to urine and saliva analysis, and there is feedback that some young people, especially adolescents, hold on to their hair, or hairstyle, in an adamant manner.

12.11 Sweat testing is a relatively new technology that can utilize two approaches to drug detection. The first is aimed at the detection of recent use and involves the collection of a sample of sweat at one point in time with the use of a swab, an analysis of which can detect drug use up to 48 hours prior to the test. The second approach, which is more commonly used, is aimed at monitoring drug use that may occur over a predetermined time period. This approach involves applying an adhesive patch to the donor's skin for up to seven days. During this time, any drugs excreted by sweat are collected and stored in the patch. Sweat patches are particularly useful for detecting low levels of drug use. However, sweat testing is more expensive compared to urine and saliva analysis. It is necessary to store sweat specimens at a very low temperature, creating storage and transportation problems. Furthermore, sweat testing is a relatively under-researched technology compared to urine, saliva and hair testing. Consequently, to minimize chances of false positives, positive test results have to be confirmed by a different test type (usually urinalysis).

12.12 Researchers pointed out that drug testing cannot provide a direct or reliable measure of intoxication, determine how much, how often or under what circumstances a drug was used (e.g. passive ingestion of cannabis), distinguish between experimental, occasional or one-off users and those with problematic drug use, nor distinguish between similar metabolites found in over-the-counter or

intrusive and is unlikely to be used in routine drug monitoring.

legally prescribed medications and illicit drugs (e.g. codeine versus illicit opiates).

12.13 Furthermore, researchers also cautioned that the tests described above cannot detect inhalant abuse, a problem that can have serious, even fatal consequences. Inhalant abuse refers to the deliberate inhalation or sniffing of common household products—gasoline, correction fluid, felt-tip markers, spray paint, air freshener, and cooking spray, to name a few—with the purpose of "getting high." [113]

Drug testing technology in Hong Kong

12.14 For the Scheme in Tai Po, the drug testing method used is similar to those recommended by Australian National Council on Drugs, which comprises a two-stage process. The first stage is an initial screen to detect the presence of 5 drugs, namely ketamine, ecstasy, methylamphetamine, cannabis and cocaine, using a POCT device on a urine sample. If the screening test returns a positive result, another screening test on the same urine specimen using a urine kit of a different brand will be conducted. If the second test result is negative, the student will be treated as a negative case. If the results of the two screening tests are positive, the same urine sample will be taken to the Government Laboratory for a confirmatory test, using sophisticated instruments, namely gas chromatography-mass spectrometry (GC-MS) or liquid chromatography-mass spectrometry (LC-MS).

12.15 Other schools in Hong Kong that have implemented drug testing use either urine or hair sample, and the testing are conducted by laboratories. From discussion with experts in the field, the Project Team is given to understand that different kinds of drugs, including inhalants, ethanol or prescription drugs such as benzodiazepines, barbiturates, nicotine and codeine could be detected in the laboratory. Some experts considered hair test more powerful than urine test, because hair test could identify the drug abuse history of the abusers, subject to the limitations that there were variations in hair growth for different persons and for different parts of the head of the same person. However, other experts have considered that hair test could play a complementary role to other drug testing such as urine test, having regard to the difference in detection time window

113 US Office of National Drug Control Policy (2002), *What you need to know about drug testing in schools*.

between hair test and other tests. Some experts have also argued that it is difficult to say which drug testing methods are better and it should depend on the purpose(s) of drug monitoring programme. In general, urine test could detect drugs recently taken, while hair test could only detect drugs taken by the person several days to months before the test.

12.16 The Project Team notes that while there were four false positive cases encountered in the Scheme, the Scheme was not designed to gather information on the number of false negatives. Admittedly, false positives should be kept to an absolute minimum in view of the potential psychological stress and other possible adverse impact on the students (and their parents as well) concerned. False negatives are obviously equally undesirable, as we may be mistaken to believe that the students are not using drugs when in fact they are. During discussions with academics and experts on drug testing, they pointed that POCT could be an effective testing method in other countries where the most common type of drug abused is cannabis. However, they cautioned that the use of POCT in Hong Kong, where Ketamine is a more commonly abused drug, must be carefully considered with due consideration of the short detection window for Ketamine. According to these academics and experts, Ketamine would quickly metabolize after being taken by a person, and Ketamine or its metabolites may not easily be detected by a POCT of low sensitivity.

12.17 Researchers also warned that visually read test results of POCT, although quite simple in most pregnancy test, was dramatically more complicated in drug testing. Most POCT drug tests contain multiple analyses when testing for a number of drugs. There is considerable subjectivity in interpreting test results, leading to potential false-negative and false-positive errors. Timing is also critical, as improperly timed readings could potentially result in erroneous results. Lighting conditions may also play a role in the accuracy in reading the visually interpreted endpoints. [114]

12.18 Despite the shortcomings of POCT, the Project Team sees that there are obvious advantages of conducting screening tests using POCT. In the first place, it is much cheaper than laboratory test. Secondly, the immediate availability of test results by POCT will enable immediate support and counselling be given to drug abused students. Nevertheless, the Project Team is mindful of the possibility of

114 Murray, Lappe (2005), "Instrumented urine Point-of-Collection Test (POCT) using eScreen System", in Wong, Raphael C and Tse, Harley Y (ed.), *Drugs of Abuse: bodily fluid testing*.

false-positive test results by POCT, and therefore would like to emphasize the importance that anyone tested positive by POCT must be put under close attention of parents, teachers and social workers in the interim while waiting for the confirmatory test results.

Observations

12.19 There are pros and cons of different drug testing methods. The choice depends on the purposes of the tests, costs and other practical considerations (e.g. acceptability by students). During discussions with students, many of them were not in favour of hair testing because they thought that cutting their hair would affect their appearance. Experts on the other hand advised that strands of hair could be cut from different parts of the head, without affecting at all the appearance of the persons. Normally, not more than 40 to 50 strands of hair are required for drug testing. [115] Though some students still considered the production of urine samples embarrassing, most students in Tai Po seemed to have accepted urine testing. If hair testing has to be introduced, the Project Team suggests that much effort should be made to overcome possible students' resistance to hair testing.

12.20 The Project Team notes that at present, urine drug testing is most commonly used in Hong Kong. There are both onsite POCT test kits and laboratory testing available for urinalaysis. Given limitations of urine drug testing discussed above, the Project Team believes that hair testing is a possible innovative method in complementing urinalysis. The Project Team also notes that following the Chief Executive's steer for the Government to take the lead in bringing in hair drug testing, Government Laboratory has successfully developed the hair drug testing method and obtained accreditation by the Hong Kong Accreditation Service for complying with the international standard of ISO 17025. A hair testing pilot scheme has also been implementedsince 1 June 2010. Hair testing service is provided by the Government Laboratory and is open to NGOs providing drug treatment and rehabilitation services and the seven Substance Abuse Clinics of Hospital Authority with a view to offering an alternative drug

115 Different researchers have different views on the number of strands of hair required for drug testing. Some suggest that as few as five strands will suffice while others argue that about 100 strands will be needed. Notwithstanding, as hair can be collected from different parts of the head, it is not considered that the taking of such a limited amount of hair will affect the appearance of the persons subjected to hair testing. For information, the Government Laboratory requires about 80 mg of hair to be collected for hair testing under a pilot scheme pioneered by the Narcotics Division.

testing method, gauging their demands for such service and preparing for the transfer of hair drug testing technology to the industry. Separately, the Hong Kong University of Science of Technology (HKUST) has also been developing a hair testing method using a similar, but slightly different technology than the one adopted by the Government Laboratory, and is seeking funding for further research and development. As part of its on-going development process, HKUST is offering an initial complimentary service to international schools and NGOs in the anti-drug sector at a capacity of about 50 samples per week. They hope to continuously upgrade the technology platform and to obtain accreditation of its method.

12.21 It should be noted that students may change their drug abuse pattern in order to avoid a certain drug testing method. For example, if a school adopts urine testing, students may take drugs during holidays and stop only several days before they return to schools. They may switch to a different drug not tested. Thus, it is desirable for schools to be flexible in the choice of drug testing methods and the types of drugs tested in response to changes in students' drug abuse patterns. While urine testing with on-site screening and laboratory confirmation may continue as the base option, in light of its successful implementation in the Scheme in Tai Po and being much less expensive than other options like hair testing, schools should choose the testing method according to their own circumstances, or may even choose to adopt both urine and hair testing at the same time.