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Evidence-Based Risk Assessment Screening in Police Custody: The HELP-PC Study in London, UK

Iain McKinnon and Don Grubin

Abstract.
The welfare of detainees in UK police custody is the responsibility of Custody Officers (COs). COs need to identify detainees who have significant health problems and require the attention of a health care professional. We piloted a new risk assessment screen in 2012 in a police custody suite in London, UK. Data were compared with our evaluation of the standard National Strategy for Police Information Systems (NSPIS) risk assessment in 2009–10. We have demonstrated that a structured screen can improve the pickup rate of detainees with head injuries, physical and mental health problems, as well as those at risk of alcohol withdrawal syndrome. By consolidating health problems associated with elevated suicide risk, the detection of higher risk detainees was also significantly improved. The Metropolitan Police Service is planning to implement this risk assessment and we recommend a wide scale evaluation of its clinical impact and upon custody health services.

Introduction
Overseeing the health and welfare of police custody detainees is a key task for the Custody Officer (CO) in UK police forces. Compared with prison research, however, there have been few investigations of the health needs of police custody detainees, but in keeping with prison studies, a range of physical, psychiatric, and substance-related morbidity has been found in this setting (Best et al., 2004; Payne-James et al., 2005; McKinnon and Grubin, 2010; Payne-James et al., 2010; Carter and Mayhew, 2010; Ceelen et al., 2012; Sirdifield and Brooker, 2012). Concerns have also been expressed regarding deaths in and following detention in police custody (Independent Police Complaints Commission, 2010).

The CO, usually a police sergeant, is expected to detect health morbidity and to act appropriately when it is found, for both human welfare and evidential reasons. In England, Wales, and Northern Ireland, this role is incorporated in statute (Department of Justice Northern Ireland, 2012; The Home Office, 2012). Although no equivalent Act exists in Scotland, a recent report by Her Majesty’s Inspectorate of Constabulary for Scotland (2008) suggests that in the main the management of detainees there reflects practices elsewhere in the UK.

Screening for health morbidity forms part of the ‘risk assessment’ that typically takes place on reception into custody. Guidance for COs on when to call a health care professional (HCP) is contained within Section 9 of PACE Code C in England and Wales. Further guidance from the British Medical Association and Faculty of Forensic and Legal Medicine is also available to guide COs to call a HCP:

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1 This article presents independent research funded by the National Institute for Health Research (NIHR). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.
'Where a person in detention appears to the custody officer to be:

- suffering from physical illness; or
- injured; or
- suffering from a mental disorder; or
- in need of medical attention.'

(British Medical Association, 2009)

If the CO is uncertain of the need for a HCP, one should be called. Code C of the Police and Criminal Evidence Act (PACE) is more detailed, describing specific conditions that require the attention of a HCP. This includes detainees with:

- asthma;
- diabetes mellitus;
- epilepsy;
- cardiovascular diseases;
- injuries;
- the mentally vulnerable;
- those intoxicated with or at risk of withdrawal from substances.

(The Home Office, 2012).

In the case of mentally vulnerable detainees, an appropriate adult (AA) should also be called, although there is no definition of what constitutes ‘vulnerability’ under PACE (Nemitz and Bean, 2001). However, Annex E of PACE Code C does provide some further guidance on this issue.

Concerns have been raised about the ability of COs with no clinical training to accurately identify detainees who have significant health needs (Independent Police Complaints Commission, 2010) and mental vulnerability (Pearse et al., 1998). A recent evaluation of screening in Australian custody suites found high false negative rates in the detection of detainees with mental illness (Baksheev et al., 2012).

We undertook an evaluation of the National Strategy for Police Information Systems (NSPIS) custody risk assessment used by the Metropolitan Police Service (MPS) in 2009–10 (McKinnon et al., 2013; McKinnon and Grubin, 2013). Prior to this, to our knowledge there had been no specific evaluation of the efficacy of the risk assessment screen in this setting. In summary, we found a high prevalence of a range of health disorders and corroborated the widely held belief that current routine screening fails to identify substantial amounts of morbidity. In addition, where morbidity was correctly detected, there were marked variations in the quality of the documentation and its relevance to decision making. In the light of these findings, we recommended that modifications should be made to existing screening procedures in police custody settings. In this article we report the results of the introduction of a newly designed health screen in one busy MPS custody suite.
Method

Developing a pilot risk assessment screen
The pilot risk assessment screen was developed using data from our 2009–10 evaluation, previous revisions to prison mental health screening (Grubin et al., 2002), advice from two Medical Directors of the MPS, and focus groups of COs. Figure 1 describes the project timeline. We were mindful that the screen had to be fit for the purposes of detecting morbidity and also be acceptable to the users of the screen; focus groups were set up with COs to revise drafts of the pilot risk assessment screen.

Due to the complex nature of clinical presentations in custody settings, a physiological systems approach to the risk assessment screen has been adopted (Fig. 2). A section specific to female detainees is also included; this appears when relevant. Within each category, COs are directed to ask specific questions of the detainee, then make an objective comment based upon their observation, with specific observational prompts provided in the mental disorders section. If detainees are uncooperative or do not answer questions, the observations sections are still completed.

Where morbidity is identified, the screening tool provides the CO with guidance regarding the next steps, such as when to call for a HCP (and if so with what level of urgency) as well as consideration of whether an AA is required. Guidance is also given on the circumstance in which an emergency ambulance should be called.

Evaluation of the risk assessment screen
Colindale custody suite was identified to host the pilot but was temporarily closed for refurbishment shortly before the pilot was due to take place. Therefore, the pilot took place at Harrow Road Police Station where Colindale staff were based between 23 May and 17 August 2012.

All detainees brought into custody were screened using the new instrument; the standard NSPIS risk assessment was bypassed for the duration of the pilot. In order to evaluate the efficacy of the new screen, detainees were subsequently assessed by research doctors blinded to the outcome of the COs’ screens. The findings of the researchers were later compared with those of the new screen.

Detailed descriptions of the methodology and approach to obtaining consent are described elsewhere (McKinnon et al., 2013; McKinnon and Grubin, 2013). In brief, detainees aged 18 years who were arrested and detained under the auspices of PACE were eligible for inclusion. Researchers were present in the custody suite 7 days a week for at least 10 h per day to ensure that a cross-section of arrest times was achieved. The research assessment was similar to that used in the 2009–10 risk assessment evaluation but with the addition of a more robust psychiatric interview (Sheehan et al., 2004), alcohol dependency evaluation (Saunders et al., 1993), and the Kingsbury Learning Disability Screening Questionnaire (personal correspondence) to enhance inter-rater reliability. The research evaluations culminated in a clinical decision as to whether a HCP was required, and if so for what reason.

Detainees who lacked capacity to consent were not interviewed by the researchers, but the basis of the incapacity was recorded and included in the overall data analysis.
We evaluated the signal detection properties of the screen and the appropriateness of referrals to the HCP. The primary outcome measures were:

1. the efficacy of the screen (sensitivity and specificity) overall and for individual morbidities, and
2. a comparison with the standard NSPIS screen from the 2009–10 evaluation.

At the end of the pilot period, COs reverted to the NSPIS risk assessment.

Power calculation
We considered the detection of detainees with psychosis or serious mental illness for the power calculation. In order to detect a clinically meaningful improvement in the sensitivity of the screen, we calculated that a sample size of 360 was necessary to detect a sensitivity >90% with 80% power at an alpha level of 5%.

Data analysis
Researchers collected clinical data using paper forms which was later entered onto Microsoft Excel spreadsheets. Data from the pilot risk assessment screen carried out by the COs were also transferred from the MPS’ Microsoft SharePoint server to a Microsoft Excel spread sheet. The data were combined and subsequently analysed using IBM SPSS version 19 and Minitab version 16.

Ethical approval
Newcastle and North Tyneside Research Ethics Committee approved the study in 2011 (11/NE/0057)

Results
In total, 1284 detainees were brought into custody during the pilot. Researchers were present in the custody suite for 74 days (88%). In all, 606 detainees were eligible for inclusion of whom 323 detainees (53%) were interviewed (Table 1).

Twenty-eight detainees (5%) lacked capacity to consent to take part in the research. The reason for the lack of capacity was noted and compared with the pilot risk assessments. These detainees were not interviewed by the researchers.

There were a number of other reasons eligible detainees were not interviewed by researchers: 96 (16%) were not available for us to approach, 77 (13%) declined consent, 55 (9%) had insufficient English to understand the study information, 6 (1%) were intoxicated and had not sobered sufficiently for researchers to re-approach, 17 (3%) were considered by the CO to be too high a risk for researchers to interview alone, two agreed but were released before consent could be taken, and one detainee required urgent medical attention and was taken to hospital.

Efficacy of the screen
The pilot risk assessment screen indicated the need for a HCP in 90% of the cases in which researchers considered a HCP was required [95% confidence interval (CI) 85–94%], suggesting that about 10% of cases were missed. It was negative in 94% of cases where the researcher concluded there was no need for a HCP (95% CI 89–97%), indicative of a false positive rate of 6%. 
Due to the nature of the NSPIS screen, it was not possible to directly compare the pilot screens with the 2009–10 NSPIS screen evaluation using this approach. However, we were able to compare the appropriateness of calls for a HCP between both screens. In this respect, there was a 15% improvement in detection (95% CI 6–24%) and a 12% reduction in false positives (95% CI 1–23%).

Physical health disorders
Table 2 shows true positive rates for the pilot risk assessment screen and NSPIS screen in respect of individual physical health morbidity together with the proportion of detainees referred to the HCP for each.

There were statistically significant improvements in the detection of asthma, diabetes mellitus, and cardiovascular complaints. Improvements in the detection of epilepsy and serious head injury did not reach statistical significance, but numbers were small. Improvement in the referral rate to the HCP for detainees with these physical problems was also seen.

The proportions of detainees wrongly screened positive for physical disorders was low (between 1% and 5% across morbidity areas).

Mental disorders
Table 3 shows the true positive rates for the two screens for individual mental disorders. The proportions referred for an AA are also shown. Although not necessarily required, COs may have referred detainees who screened positive for intellectual disability to the HCP for an opinion on whether an AA was required or for other unrelated reasons.

Of the 81 detainees who screened positive in the pilot risk assessment screen’s mental health section, 45 [56% (95% CI 44–67%)] were either psychotic or had major depression. Only 10 [12% (95% CI 6–22%)] were judged to have no mental disorder by researchers. The remainder suffered from other less serious mental disorders.

Eighty-two of the 114 detainees (72%) considered to be at elevated risk of suicide were detected by the pilot screen compared with 52 out of 107 (49%) for the NSPIS screen (difference: 23%, 95% CI 11–36%). Of the 114 higher risk detainees, 99 (87%) were placed on enhanced observation at reception during the pilot.

Risk of substance withdrawal
The pilot risk assessment screen detected 31 of the 41 (76%) detainees who were judged at risk of Alcohol Withdrawal Syndrome, a medical emergency. This compared with 20 of 42 (48%) detected by the NSPIS screen. The 28% improvement was statistically significant (95% CI 8–48%).

With respect to detecting detainees at risk of withdrawal from Class A drugs, there was a modest improvement for opiates: 87% versus 72% (95% CI for difference: 10% to 39%) and a worsening for crack cocaine (23% versus 32%, 95% CI for difference: 35% to 17%).

The number of detainees judged at risk of withdrawal by researchers differed substantially between the 2009–10 evaluation and this 2012 study. For opiates, respective prevalences

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2 The generation of a National Medical Record within NSPIS indicated that the CO had called a HCP.
were 11% and 5% (95% CI for difference: 1–10%); for crack cocaine, respective prevalences were 21% and 2% (95% CI for difference: 14–25%).

**Impact upon the HCP referral rate**

Prior to the introduction of the new screen, 43% of detainees were referred to the HCP. During the period in which the screen was used the referral rate was 45%. The rate was 44% after the pilot finished. The second week of the pilot and the seventh week post-pilot had the highest referral rates (61% in both; see Fig. 3.)

**Time taken to complete the risk assessment**

The median time taken to complete the screen during the first full week was 11 min 9 s. This reduced to 7 min 45 s by the final full week of the pilot (Mann–Whitney U: 2804.5, P < 0.001).

**Discussion**

The Health Screening of People in Police Custody (HELP-PC) project is a study of health screening and risk assessment carried out by researchers from Newcastle University in partnership with the MPS in London. The modified screening processes demonstrated improvements in the rate of detection of significant health morbidity by COs while also reducing the number of detainees needlessly referred for the attention of a HCP.

There were significant improvements in the detection of detainees with asthma, diabetes mellitus, and cardiovascular complaints. There were clinically important improvements in the detection of epilepsy and serious head injuries; it is likely that low background prevalence contributed to its statistical non-significance.

Detection of alcohol withdrawal risk improved substantially, although this was not the case for detainees at risk of Class A drug withdrawal. The Colindale custody suite is not a drug testing site, whereas the Islington custody suite, which was the site of our earlier study, routinely tests detainees arrested for ‘trigger offences’. Due to this, detainees at Islington may have been more likely to divulge drug use knowing they may be tested. Rewording of the risk assessment may be of some merit here, but self-report is probably not sufficient to recognize many of those at risk of withdrawal from drugs unless the detainee believes there will be something to be gained by making such a disclosure.

In the case of the detection of detainees with psychosis there was a statistically significant improvement in the true positive rate compared with the NSPIS risk assessment. There was also a small improvement in the true positive rate of detainees with major depression.

Only a small number of detainees who screened positive in the psychiatric disorders section were judged to have no diagnosable mental disorder by the research doctor. As the NSPIS screen is relatively unstructured, it is not possible to make a valid evaluation of how false positive rates compared between the two screens.

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3 The NSPIS screen does not differentiate between mental disorders, making it difficult to compare the two screens. We had previously reported that for detainees with psychosis, the NSPIS screen recorded ‘any mental disturbance’ in 79% of cases. To compare it with the pilot screen, which had to meet a more stringent test to be considered a screen positive, we re-analysed the NSPIS data. Using similarly stringent criteria (documentation of ‘psychosis’ or a specific diagnosis) we found that only 58% of these cases had been detected by the NSPIS screen
By consolidating screening questions from the ‘suicide risk’ section with information about mental disorder and alcohol withdrawal elsewhere on the screen we were able to increase the detection rate of those considered to be a higher risk of self harm or suicide from less than half to almost three quarters. Questions remain as to whether the custody desk is the most appropriate place to ask sensitive questions about suicide, but we have shown that there is potential for improvement even within the current custody configuration.

We consider that the enhancements seen here are the result of providing COs with a structured, clinically relevant, evidence-based set of prompts to screen for physical, mental, and associated disorders. It allows COs to have a more clinically relevant interaction with health services where necessary. This was not the case for the NSPIS risk assessment we evaluated in 2009–10.

Discrepancies were found between the number of detainees being screened positive and the marginally smaller number of detainees for whom a HCP was called. Similarly, improvement in the detection of detainees with psychosis and intellectual disability did not result in a corresponding increase in the rate of AAs called. Although the new screen guides the CO on the appropriate course of action, COs may be continuing to exercise their discretion in the cases where they believe an AA is either not required or not readily available. Police forces may want to consider whether this represents a potential training issue for COs.

There was no increase in referrals to the custody HCP during the pilot suggesting that although more of the detainees needing attention received it, the referrals made were more appropriate. This is encouraging in the drive to improve efficiencies within custody healthcare.

As COs became more familiar with the screen the time taken to complete it fell accordingly. Comparative data for the time taken to complete NSPIS risk assessments is not available, although the pilot risk assessment is likely to take marginally longer to complete. The IT infrastructure of Harrow Road Police Station limited the speed of the software required to host the pilot risk assessment screen. With a contemporary IT platform we anticipate that the time needed to complete the screen can be reduced substantially.

**Limitations**

We have made comparisons to the efficacy of the NSPIS study from our 2009–10 evaluation at Wimbledon and Islington custody suites. Ideally the pilot would have taken place at these sites, but logistical considerations beyond our control precluded this. Nonetheless, the two screens were judged against the same clinical criteria.

This was a pragmatic study of the clinical efficacy of a pilot risk assessment screen. A randomized trial of the intervention would have been a more robust evaluation of this new intervention. However, it was felt that this may introduce undesirable risks into an already chaotic and unpredictable environment.

Another limitation of this study is the non-inclusion of detainees aged <18 years. There are specific ethical and legal issues associated with recruiting younger people for clinical interview where parental consent is not available. The risk assessment screening process needs to be fit for all detainees, and we recommend this special group is considered in future work.
It is possible that improvements we have seen are partially explained by the Hawthorne effect, that is, changes in the behaviour of COs caused by the research itself, with their performance improving as researchers were present on site. However, researchers were also on site during the earlier 2009–10 evaluation with which this study is compared. Regardless, whether or not this is the case can only be clarified by longer term evaluation.

Conclusion
The MPS is planning to implement this risk assessment screen in their custody suites. A wider, more robust evaluation will be required. This should include consideration of the overall impact on police and health care services, liaison and diversion, AA use, an economic evaluation, and any impact on rearrest rates. A randomized trial may not be feasible within one custody suite, but a clinical trial may be possible comparing similar custody suites, with one introducing the new screen while the other continues to use the standard screen.

Acknowledgements
IM and DG carried out the pilot in collaboration with the MPS. Dr Samir Srivastava and Dr Gurpreet Kaler assisted with data collection and data analysis. Sergeant Cathy Nicholson, Custody Directorate, coordinated the pilot with IM, under the oversight of Superintendent Annette Wightman. Mr David Matthews, Department of Information, MPS converted the initial HTML drafts of the pilot risk assessment screen into the final MS InfoPath form used in the pilot. Thanks to Dr Margaret Stark and Dr Meng Aw-Yong, respective directors of the MPS’ Medical Directorate for guidance on the content of the new risk assessment screen. We are also extremely grateful to the Colindale COs and HCPs who graciously took part in the focus groups and the pilot, as well as providing us with invaluable critical feedback; there are too many of them to name. Finally thanks to Inspectors Mary Bristow and Michael Carson at Colindale Custody who supported the research team throughout.
Tables and figures

Figure 1. Flowchart of the project timeline.

- **Oct 2010**
  - Presentation of results from the evaluation of the NSPIS screen

- **Jan-Apr 2011**
  - Initial drafts of new screen on paper in consultation with MPS medical director

- **Jun 2011**
  - Jun 2011 Ethical approval obtained

- **Jul-Dec 2011**
  - IM further developed the screen using HTML and JavaScript for functionality.
  - MPS IT engaged.
  - Pilot site identified

- **Dec 2011**
  - Focus groups and training for sergeants from pilot site.

- **Jan 2012**
  - Further input from new MPS Medical Director

- **Mar-Apr 2012**
  - Mar-Apr 2012. MS InfoPath versions finalised.

- **May 2012**
  - May 2012. Further training for COs. Pilot goes live

- **May 2012**
  - Aug 2012. Pilot ends. Data analysis commences
**Figure 2. Layout of the pilot risk assessment screen.**

<table>
<thead>
<tr>
<th>Assessment of conscious level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries</td>
</tr>
<tr>
<td>Physical health</td>
</tr>
<tr>
<td>Medication</td>
</tr>
<tr>
<td>Drugs (intoxication and withdrawal risk)</td>
</tr>
<tr>
<td>Alcohol (intoxication and withdrawal risk)</td>
</tr>
<tr>
<td>Mental disorders</td>
</tr>
<tr>
<td>Learning (intellectual) disability</td>
</tr>
<tr>
<td>Potential suicide risk</td>
</tr>
</tbody>
</table>
Figure 3. Referral rate to HCP prior to, during and after the pilot period.
Table 1. Demographics of 323 detainees interviewed.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years: mean (median)</td>
<td>32.1 (30)</td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>292 (90)</td>
</tr>
<tr>
<td>Ethnicity, n (%)</td>
<td></td>
</tr>
<tr>
<td>W British</td>
<td>137 (42)</td>
</tr>
<tr>
<td>B&amp;ME British</td>
<td>96 (30)</td>
</tr>
<tr>
<td>W non-British</td>
<td>49 (15)</td>
</tr>
<tr>
<td>B&amp;ME non-British</td>
<td>41 (13)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>149 (46)</td>
</tr>
</tbody>
</table>
Table 2. Comparison of true positive rates (sensitivity) and referral rates to HCP for physical health disorders.

<table>
<thead>
<tr>
<th>Disorder</th>
<th>True positive rate Pilot</th>
<th>Change (95% C.I.)</th>
<th>True positive rate NSPIS</th>
<th>Change (95% C.I.)</th>
<th>Referred to HCP Pilot</th>
<th>Change (95% C.I.)</th>
<th>Referred to HCP NSPIS</th>
<th>Change (95% C.I.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>32/42 (76%)</td>
<td>+24% (3 to 45%)</td>
<td>18/37 (49%)</td>
<td>+33% (6 to 60%)</td>
<td>30/42 (71%)</td>
<td>+4% (-16 to 24%)</td>
<td>25/37 (68%)</td>
<td>+17% (-4 to 38%)</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>7/7 (100%)</td>
<td>+33% (6 to 60%)</td>
<td>8/12 (67%)</td>
<td>+33% (6 to 60%)</td>
<td>7/7 (100%)</td>
<td>+17% (-4 to 38%)</td>
<td>10/12 (83%)</td>
<td>+17% (-4 to 38%)</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>5/6 (83%)</td>
<td>+11% (-43 to 66%)</td>
<td>3/5 (60%)</td>
<td>+11% (-43 to 66%)</td>
<td>6/6 (100%)</td>
<td>No</td>
<td>5/5 (100%)</td>
<td>difference</td>
</tr>
<tr>
<td>Active cardio-vascular complaint</td>
<td>10/32 (31%)</td>
<td>+29% (12-46%)</td>
<td>1/44 (2%)</td>
<td>+29% (12-46%)</td>
<td>20/32 (63%)</td>
<td>+4% (-19 to 26%)</td>
<td>26/44 (59%)</td>
<td>+4% (-19 to 26%)</td>
</tr>
<tr>
<td>Serious head injuries</td>
<td>4/7 (57%)</td>
<td>+40% (-2 to 83%)</td>
<td>2/12 (17%)</td>
<td>+40% (-2 to 83%)</td>
<td>7/7 (100%)</td>
<td>+25% (1 to 50%)</td>
<td>9/12 (75%)</td>
<td>+25% (1 to 50%)</td>
</tr>
</tbody>
</table>
Table 3. Comparison of true positive rates (sensitivity) and referral rates to HCP for mental and associated disorders.

<table>
<thead>
<tr>
<th></th>
<th>True positive rate</th>
<th>Change (95% CI)</th>
<th>Called AA</th>
<th>Change (95% CI)</th>
<th>Referred to HCP</th>
<th>Change (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pilot</td>
<td>NSPIS</td>
<td>Pilot</td>
<td>NSPIS</td>
<td>Pilot</td>
<td>NSPIS</td>
</tr>
<tr>
<td>All Psychosis†</td>
<td>26/28 (93%)</td>
<td>11/19 (58%)</td>
<td>15/28 (54%)</td>
<td>8/19 (42%)</td>
<td>25/28 (89%)</td>
<td>18/19 (95%)</td>
</tr>
<tr>
<td>Major depression</td>
<td>21/28 (75%)</td>
<td>9/13 (69%)</td>
<td>3/28 (11%)</td>
<td>0/13 (0%)</td>
<td>25/28 (89%)</td>
<td>6/13 (46%)</td>
</tr>
<tr>
<td>Intellectual disability</td>
<td>5/6 (83%)</td>
<td>2/8 (25%)</td>
<td>3/6 (50%)</td>
<td>4/8 (50%)</td>
<td>2/6 (33%)</td>
<td>5/8 (63%)</td>
</tr>
</tbody>
</table>

† Includes all detainees judged to have affective or non-affective psychosis by the researchers.
References


